



# **SUPPORTING DISADVANTAGED CHILDREN TO ENTER KINDERGARTEN**

Experimental Evidence  
from Bulgaria



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Experimental Evidence  
from Bulgaria

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## Abstract

Equalizing opportunities among children is a critical human development challenge. There is a growing concern that children from disadvantaged families lag behind children from advantaged families because the former do not participate in quality early childhood development opportunities, including preschool, as much as the latter. A crucial question is thus to find efficient ways to increase kindergarten participation of children in poor communities. This paper presents findings from a large scale multi-arm randomized control trial implemented in 2014-2015 across 236 poor settlements across Bulgaria with the aim to improve full-day kindergarten participation of poor children, especially Roma and Turkish. It finds that removing the costs of kindergarten reduced the share of children aged 3-6 not registered in kindergarten by half – while also significantly increasing attendance by about 20%. Additional financial incentives of either BGN7 or BGN20 monthly conditional on attendance had no clear impact on registration and attendance, suggesting that financial cost is a more important barrier than behavioral issues. Organizing community meetings to provide information about the importance of kindergarten also did not impact participation in kindergarten, although it slightly improved parental perceptions of the benefit of kindergarten and raised parental aspirations for their children – especially girls. Overall, removing kindergarten costs was thus the most cost-effective strategy to increase kindergarten participation. However, the effect on short-term child development – emergent literacy, numeracy, motor and socio-emotional skills – is mixed: slightly positive for Bulgarian children, while negative for Roma and Turkish children. These results suggest that all children may not immediately benefit from kindergarten, especially minority children who may need additional support to successfully transition to, and benefit from, kindergarten exposure.

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# Introduction

## Objectives

The primary objective of this impact evaluation is to provide policy relevant information on how to most cost-effectively increase kindergarten participation in disadvantaged communities in Bulgaria.

## Value added of this evaluation

Equalizing opportunities among children is a critical human development challenge. There is a growing concern that children from disadvantaged families lag behind children from advantaged families because the former do not participate in quality early childhood development opportunities, including preschool, as much as the latter. International evidence underscores the critical importance of an early start to support children – poor children especially – reach their full potential. Against this background, finding cost-effective strategies that promote greater access to quality preschool and create a supportive early learning environment for disadvantaged children is critically important. This study aims to inform policy making with hard evidence on how most cost-efficiently encourage participation in early education programs and its short-term effects on child development.

## Country and policy context of the evaluation

**The inequities start early in life:** the UNDP/World Bank/EC regional Roma survey (2011) from Bulgaria, Romania, Hungary, Slovakia, and Czech Republic found that while more than 75% of all children aged 3-6 nationally are in preschool, the large majority of disadvantaged children are not. **The European Commission encourages Member States to increase preschool participation.** The *EC Communication on an EU Framework for National Roma Integration Strategies* (EC, 2011) issued in April 2011 and endorsed by the European Council on 24 June 2011 calls on all Member States to “widen access to quality early childhood education and care” (p.6), and, referring to the February 2011 communication “Early Childhood Education and Care: Providing all our children with the best start for the world of tomorrow”, it argues for increased access to high quality non-segregated early childhood education.

**Bulgaria has similarly seen an increased emphasis on preschool.** Legal amendments from September 2010 provide for 2 years of compulsory preschool education to encompass all 5 and 6-year-olds. The municipalities had 2 years to ensure that they could accommodate all children. For 5 and 6-year-old children, the educational services are free of charge. However, kindergartens charge fees to cover additional non-education costs and many ask parents to provide some in-kind supplies. Most of these costs were removed in the “free access” intervention. At the time this study began in September 2014, participating in some form of preschool programs was thus *de jure* compulsory and free of charge for the 5 and 6-year-old children.

In the context of Bulgaria, families with monthly income less than or equal to BGN 350 per family member receive a **child allowance** for each child aged 1 or more. For children aged 5 and 6, this allowance is conditional on the child regularly attending a preparatory preschool group (either half-day or full day), unless this is impossible due to the condition of the child’s health. In 2014, the monthly child allowance was BGN 35 per month.

Whether the above legal provisions were successful in eliminating the costs and raising preschool rates among Roma children was not clear.

**Full-day kindergartens are the preferred modality for early childhood education in Bulgaria.** Kindergartens serve 3 to 6-year-old children (but only the 5-6-year-old groups are referred to as preschool). Children study in the morning from 8 to 12, they are provided morning and afternoon snacks and lunch, then take a nap, and then play until 4 or 5pm. In 2014 and 2015 approx. 92% of all children enrolled in public early child



education programs attended a full day kindergarten. While the number of children enrolled in all available types of kindergartens slightly decreased by 0.1% in 2015 over 2014, the full day kindergarten enrollments increased by 0.6%. Most parents are given the choice between a full day kindergarten programs for ages 5 and 6 (compulsory pre-schooling) and half day free programs, which at the time were delivered only in primary schools. Most 5 and 6-year-old children are enrolled in full day kindergarten programs, which also reflect parental choice, even if the full day program comes at a cost of kindergarten fees. It should also be noted that kindergarten in cities fill up quickly and it is hard to find a place if the first kindergarten enrolment of a child takes place when it is 5-6-year-old. Once a child is enrolled at 3 years, its place and enrollment in the kindergarten is reserved, thus making new enrollments difficult, even for children with most pressing need. Therefore, poorer parents who choose not to pay for kindergarten for their 3-4-year-old children stand a greater chance of not having a choice where to enroll the child at 5-6 but the cost free half-day preschool programs delivered at basic and primary schools.

The cost of full-day kindergartens is shared between the central government, local governments and families, from which the municipalities collect the kindergarten fees. The central government funding covers pedagogical and part of the running non-wage operating costs and comes from per capita based block grants transferred to municipalities, which in turn are channeled in full to the full-day kindergartens using a formula, mostly according to the number of children enrolled in them. The average per child governmental financing of full-day kindergartens was BGN 1730 in 2015, up by 5% from the 2014 level of BGN 1655.

Local government funding covers infrastructure maintenance, as well as part of the running non-wage operating costs (food, transportation, materials and similar items) through the kindergarten fee revenues. The full-day kindergarten fees paid by families are determined by local governments within a centrally defined framework (the Local Taxes and Fees Act) and are collected from parents/primary caregivers directly by the kindergartens. Some municipalities set daily fees; others determine a monthly fee for full attendance that is prorated for the actual days attended; yet others apply a combination of the two methods. In a few cases, fees differ monthly according to the cost of the food. The average annual per child amount of full-day kindergartens fees was estimated BGN 176, down by 2% from BGN 183 in 2014, according to official data.

**The population targeted in this study comprises disadvantaged, mostly ethnically-segregated communities.** There are approximately 10-12 million Roma in Europe, the vast majority of whom live in deep poverty and are suffering from economic and social exclusion. The UNDP/World Bank/EC regional Roma survey (2011) finds that more than one third of Roma children in Eastern Europe go hungry at least once per month. And, while more than 80% of Roma parents report wishing at least a secondary education for their sons and daughters, less than 25% complete a secondary education. Coupled with discrimination, these factors result in very large gaps in labor market outcomes and extremely low productivity rates compared to average rates found in the poorest 25% of countries globally (WB, 2012<sup>1</sup>). With Roma numbering up to 700,000 (based on enumerator assessment), Bulgaria has one of the largest Roma populations in Europe. This study therefore pays particular attention to minority (Roma and Turkish) families as they face multiple disadvantages.

## Literature Review

**In October 2011, two Lancet papers reviewing the scientific literature underscore the importance of early childhood development (ECD) interventions, especially in addressing inequalities facing disadvantaged populations.** The first review article<sup>2</sup> underscores that inequalities in child development begin prenatally and in the first years of life. These inequalities include insufficient early intake of micronutrients (certain minerals and vitamins) and lower levels of cognitive stimulation, with large implications for the child's development. The evidence reviewed underscores that the most effective and cost-efficient time to prevent

1. World Bank (2012). *Toward an Equal Start: Closing the Early Learning Gap for Roma Children in Eastern Europe*.

2. Walker et al. (2011) "Inequality in early childhood: risk and protective factors for early child development", *The Lancet*, Volume 378, Issue 9799, Pages 1325 - 1338



inequalities is early in life before trajectories have been firmly established. The second scientific review article<sup>3</sup> assesses the effectiveness of early child development interventions. It concludes that parenting support and pre-school enrolment can improve early child development, “[...] with effects greater for programs of higher quality and for the most vulnerable children.”

Heckman et al. (2013)<sup>4</sup> similarly conclude from a review of the impact evaluation literature that high-quality intervention programs targeting disadvantaged children generally show either beneficial or no effects from the program on child and later life outcomes. And, differences in program quality can generally explain lack of treatment effects. For example, a well-known study by Baker, Gruber and Milligan (2008)<sup>5</sup> investigates the effects of Quebec’s universal childcare program on parental and child outcomes. It finds a significant and large impact on parental labor supply. However, it also finds several adverse effects of this program on children’s socio-emotional skills, and point to more hostile, less consistent parenting, worse parental health, and lower-quality parental relationships as likely explanations that weren’t sufficiently being compensated by the childcare settings. More recently, Garcia et al. (2016) study the long-run benefits of two daycare/preschool interventions: the Carolina Abecedarian Project and the Carolina Approach to Responsive Education. The findings show significant positive impacts overall but also highlight the importance of the quality dimension and show negative impacts of low-quality programs on boys<sup>6</sup>.

In 2012, the World Bank, using results from a regional household survey with a specific focus on preschool, concludes with four main policy measures to increase preschool enrollment and improve early learning at home for Roma children:

- (1) better inform parents on the benefits of preschool for children’s later-life outcomes;
- (2) promote inclusive preschools by reaching out to parents and by involving them more directly in preschool with the help of Roma teaching assistants;
- (3) remove cost barriers possibly coupled with regular attendance subsidies, and
- (4) support parenting at home.

These conclusions follow from the finding that the vast majority of Roma parents wish their children to complete secondary education, but that many also stated a desire to raise children at home in their early years when asked why they did not enroll their children in preschool. Cost was also a consideration. Almost half of parents reported being willing to reconsider enrollment if there were a Roma teaching assistant. More than half said they would reconsider if there were no fees, or if they received food coupons.

Practical experience from several government and NGO-led initiatives also support these conclusions. An example is Hungary’s much higher enrollment coupled with programs to remove cost barriers and even provide explicit subsidies to enroll children based on conditional attendance. Another example is the project Every Child in Pre-school and Kindergarten, initiated by the Romanian NGO OvidiuRo, which includes food coupons conditional on attendance. As this program seemed successful based on attendance data collected, it has been implemented into law in 2015.

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3. Engle et al. (2011) “Strategies for reducing inequalities and improving developmental outcomes for young children in low-income and middle-income countries”. The Lancet, Volume 378, Issue 9799, Pages 1339 - 1353

4. Heckman, J., R. Pinto, and P. Savelyev (2013). Understanding the Mechanisms through Which an Influential Early Childhood Program Boosted Adult Outcomes. American Economic Review 103(6), 2052–2086

5. Michael Baker, Jonathan Gruber and Kevin Milligan. (2008) “Universal Child Care, Maternal Labor Supply, and Family Well-Being” Journal of Political Economy. Vol. 116, No. 4, pp. 709-745

6. Garcia Jorge, James Heckman, Duncan Leaf, and Maria Prados, «The Life-cycle Benefits of an Influential Early Childhood Program », NBER Working Paper n°22993, December 2016

# Theory of Change

**The theory of change that motivates the design of the interventions being evaluated is based on a simple model of human capital formation.** A model of human capital posits that parents invest in the human capital of their children up to the point where the additional (marginal) expected benefits equal the additional (marginal) costs. The expected benefits from preschool are embodied in the expected improvement in cognitive and socio-emotional skills that will be subsequently leveraged in school to achieve better educational outcomes and consequently in terms of higher income and quality of life. The interventions are designed to raise the expected benefit and lower the costs of early education.

**An information component of the intervention is intended to help parents better understand the returns of preschool education and increase their perception of expected benefits.** This component also is expected to make more salient the connection between preschool activities and child development. The information component may also work in a subtler way by increasing parental trust in the kindergarten to treat their children well and fairly. It should decrease parental concern with the perceived relative social status gap between them and kindergarten staff and non-Roma parents. Based on the Economics and Identity literature, increased trust should reduce negative self-social stereotyping so that a quality education becomes part of the “possible selves” for young Roma.

**Free access to kindergarten is the most natural way to lower the monetary costs of early education.** The study will include villages or towns where a kindergarten is available so that accessibility – transportation costs or opportunity cost of time for transportation for instance – won’t be a first-order issue. In our sample, distance is reasonable, with 62% of respondents walking less than 15 minutes to kindergartens, 31% between 15 and 30 minutes, and 7% more than 30 minutes. Distance to kindergarten is also similar for majority and minority children in our sample. Thus, eliminating the direct financial cost of kindergarten (fees and other financial contributions from parents to cover the purchase of supplies for the classroom) will remove the affordability barrier to early education.

**Finally, a conditional financial incentive increases the direct utility from having a child at kindergarten since it provides an additional disposable income to the household<sup>7</sup>.** Conditional cash transfers have become popular in the past decade around the world. The conditional cash transfer is given to the family on a regular basis (typically a month) conditional on the fact that the child enrolled in the policy attend school a given amount of time (typically 80% or 90% of time). This policy has proved effective at increasing school enrolment and attendance in many countries (mostly in Latin America). Because it works as an incentive, the conditional cash transfer can help parents overcome all barriers listed above: the affordability barrier, the lack of awareness about the benefits of preschool education, the reluctance due to the social gap, and the domination of other preferences over pre-school education. However, such incentives require careful monitoring and may be cost-ineffective. Simply providing free early education may be sufficient *provided* there are no other barriers in the way, such as lack of awareness about preschool benefits and/or limited social interaction between Roma parents and non-Roma kindergarten officials.

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7. The conditional financial incentives provided under this study are on top of the existing government child allowance program, the payment of which is conditioned on regular preschool attendance for children aged 5 and 6 and is unconditional for younger children.

# Description of the Intervention

The Springboard for School Readiness intervention was jointly designed by the World Bank and the Trust for Social Achievement (TSA). The program was financed by TSA. TSA is a foundation created and funded by the America for Bulgaria Foundation (ABF). Established in 2008, ABF has been funding programs for economically disadvantaged people, including Roma. TSA partnered with 23 Bulgarian NGOs and collaborated with local kindergarten and municipal authorities.

All interventions were implemented in disadvantaged communities and full-day kindergartens.

## Intervention Arms

The intervention had the following components:

**Intervention A:** **Free access to full-day kindergartens.** The intervention intended to cover the full cost of education to eligible households to ensure that affordability is not an obstacle. The cost of education includes attendance fees as well as other formal costs: school supplies for 3-4-year-old children and laboratory tests (stool and urine) required upon enrolment or after prolonged absences. The financial contributions to kindergartens were directly paid to the kindergartens by the program partner. Since the 2010 legal provision making preschool compulsory for 5 and 6-year-old children also requires an absence of fees for the *educational services* (but not for care like food, toilet papers, etc.), the intervention is expected to especially benefit younger children aged 3-4, at least to the extent that the completely cost-free alternatives (half-day programs delivered at kindergartens and primary schools) are available only for children aged 5 and 6 years.

**Intervention B:** **Free access to full-day kindergartens + conditional BGN 7 incentive (approximately Euro 3.5).** This intervention offered the same as the previous one and added a small financial incentive: a monthly bonus was offered to the family on the condition that the child attended full-day kindergartens daily (except for absences because of illness). The monthly bonus was kept small (20% of the child benefit allowance) to serve as a nudge more than a financial gain. If families tend to prefer that their child attend kindergarten but fail at doing so because of time inconsistencies and lack of attention, a small amount may be sufficient to increase kindergarten participation. Again, the impact on parental behavior of this intervention is expected to be larger for 3 and 4-year-old children to the extent that this financial incentive is conditioned on attendance, unlike the child allowances for children aged 3 and 4 years, which is paid by the government unconditionally.

**Intervention C:** **Free access to full-day kindergartens + conditional BGN 20 incentive (approximately Euro 10).** This intervention offered the same as the previous one except that the incentive is larger (60% of the child benefit allowance). The larger incentive may be more efficient at increasing kindergarten participation than the small one in case parents have strong reasons why their kid does not attend kindergarten: they do not like kindergarten education, they have important opportunity costs of time going to kindergarten and back home, etc. Similarly to previous interventions, the impact of this intervention is expected to be greater for the 3 and 4-year-old children, but considering the larger amount, impacts on parental behaviors for the 5-6-years-old children cannot be ruled out.

**Intervention D: Information about the benefits of education and promoting interaction between parents and full-day kindergarten officials.** The intervention consisted of 5 public community meetings with duration of 45 to 90 minutes each at the kindergartens organized by the 23 implementing NGOs, for a total of about 6 hours over 10 months. The information campaign did not deal with parental skills and appropriate home-learning environment. The intervention provides parents with information about the benefits of kindergarten education to raise awareness about its importance for the further education and professional life of their child, and to encourage parents to feel more at ease in the kindergarten environment, with session 2 being a presentation by the teachers and session 3 an “open house” where parents were invited to class. These also promoted the interaction between parents and kindergarten officials. The concept was thus a “mediation and information campaign”. All households with children aged 3-5 years were invited to join the meetings through advertising by social workers and posters. The design and content of the information sessions are detailed in Appendix V.

To ensure compliance with the program, TSA designed a detailed monitoring scheme, which included random spot checks of the participating NGOs and kindergartens.

The assignment of the specific intervention(s) was done in a randomized way, described in detail in the methodology section below.

## Intervention Implementation

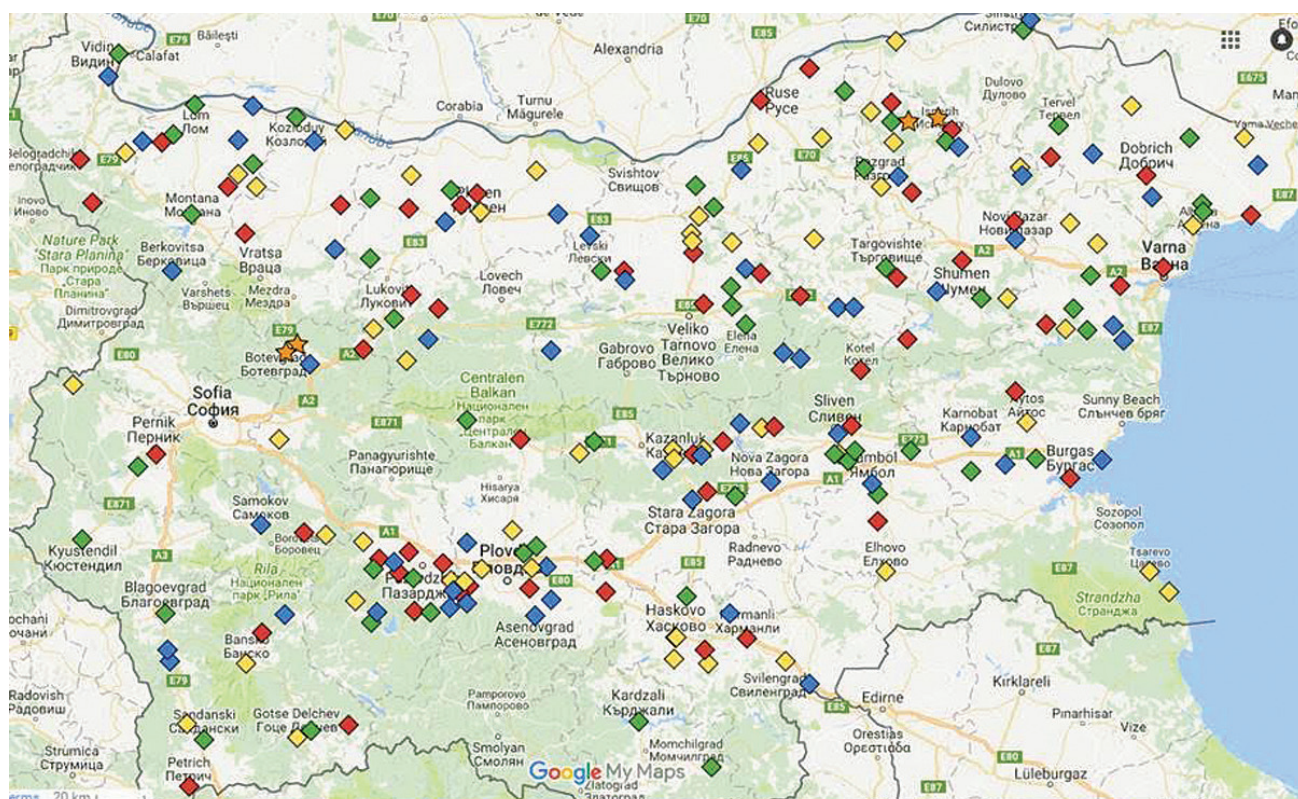
The Trust for Social Achievement launched the project in August 2014. 16 of the 23 contracted NGOs were Roma-led. TSA trained each of the NGOs and each of full-day kindergarten principals participating in the financial interventions.

An implementation constraint in some communities was that there was not enough room to enroll all the eligible children that would like to enroll. This is not a constraint for the evaluation as this is something that is part of the reality on the ground.

Figure 1 shows the allocation of financial interventions across the communities (it does not represent the allocation of the information campaign across the communities, which was equally distributed to half of the communities within each financial intervention). One color stands for one financial intervention: yellow for control communities, blue for free access communities, green for free access + BGN 7 incentive communities, and red for free access + BGN 20 incentive communities. Four communities in which TSA carried out a pilot study during 2013-2014 (and for that reason are excluded from this evaluation) are displayed as orange stars.



**Figure 1: Allocation of the four financial interventions across the 236 communities**



## Cost of the interventions

**These interventions have different costs.** Free access to full-day kindergarten is expected to be less expensive than free access combined with financial incentives, while the information treatment is expected to be less expensive than free access to full-day kindergarten.

Based on the accounting records of TSA during the school year 2014-2015 and the number of targeted children in each treatment arm (see below for a description of the study design), we estimate that the per targeted child cost of each intervention are as follows:

- Intervention A: Free access to full-day kindergartens = BGN 350 per targeted child<sup>8</sup>
- Intervention B: Free access + conditional BGN 7 incentive = BGN 412 per targeted child
- Intervention C: Free access + conditional BGN 20 incentive = BGN 528 per targeted child
- Intervention D: Information campaign = BGN 50-100 per targeted child (depending on the number of children aged 3-6 in the settlement, the cost if this intervention being largely a fixed cost)

These estimates confirm that **the information campaign is the least expensive treatment – 4 to 7 times cheaper than free access to full-day kindergarten**, while free access + conditional BGN 7 incentive is 17% more expensive, and free access + conditional BGN 20 incentive 51% more expensive than just free access. In terms of cost-efficiency, this implies that free access must be more efficient than information campaign at increasing kindergarten participation to be valuable. Similarly, providing conditional financial incentive on top of free access must be more efficient at increasing kindergarten participation than providing free access only to be valuable. We report a detailed discussion on cost-efficiency at the end of the result section.

8. The total cost of interventions A, B, C and D are respectively: BGN 516 713, 608 657, 779 558 and 287 298. The number of targeted children per intervention was 1475 for interventions A, B and C (25 children per settlement) and between 3000-6000 for intervention D (we do not observe the number of eligible children per settlement for intervention D, but feedback from the field suggests that the number of eligible children was greater than 25, and generally below 50).

# Methodology: Evaluation Design and Implementation

## Sample Population

**The sample population consisted of households, regardless of ethnicity, with children aged 3-5 living in 236 impoverished, mostly ethnically segregated settlements across Bulgaria.**

**Settlement sampling** - First, we used a list prepared by the Open Society Institute (OSI) in 2007 containing all Bulgarian settlements with at least 10 households considered as Roma by both experts and local authorities. Most of these settlements are clustered pockets of poverty: low education, low income, poor living conditions, high unemployment rates, high levels of domestic violence, high teenage birthrates etc.

Second, OSI visited these settlements to further select those which would participate in the study (“Community Listing Exercise”). The only exceptions were Sofia, Plovdiv and Varna, which were excluded because of the very limited kindergarten spaces that were available. The following criteria were used to select the settlements:

- At least 25 kids age 2 to 5 by September 2013
- Distance to full-day kindergarten less than 30 min walk (unless free public transportation is provided)
- At least 15 new places in full-day kindergarten for the project kids
- Preliminary agreement of the local mayor and full-day kindergarten principal

This two-step selection process resulted in a list of 240 targeted settlements. From this list, TSA carried out a pilot intervention in 4 communities during the 2013-2014 school year, leaving 236 communities as the target population for the impact evaluation.

**Children sampling** - In each of these 236 communities, in April 2014, OSI randomly selected 25 children who were aged 3-5 at the start of the September 2014 school year. These were identified using a random walk from 5 randomly chosen GPS points. In households with several kids aged 3-5, we selected the one with nearest forthcoming birthday (in case of twins, both). In 32 communities where there were fewer than 25 eligible children, all children were eligible. The families provided consent to participate in the study.

## Random Program Assignment to Treatment and Control

**A public lottery to assign the interventions was organized on June 30, 2014.** The lottery was held at the Sheraton, Sofia hotel, where the 236 communities, many of which are Roma settlements, were randomly assigned to the interventions. Each of the 236 mayors and the kindergartens had provided consent to participating. The lottery was held in the presence of representatives of the Ministry of Education, the National Association of Municipalities in Bulgaria, mayors, directors of full-day kindergartens, NGOs and others. Each community had been assigned to either the three financial interventions “A”, “B”, “C” or the control group, with half of the above further randomly assigned to “D” (information campaign). Using information from the Community Listing done in April 2014, this random assignment was stratified by the implementing NGO and the number of available spots in the full-day kindergarten.

This created the following randomly assigned groups:

### Financial intervention:

- Intervention A: 59 free kindergarten communities
- Intervention B: 59 free kindergarten + BGN 7 communities

- Intervention C: 59 free kindergarten + BGN 20 communities
- 59 comparison (no financial intervention)

#### Information campaign:

- Intervention D: 118 information communities
- 118 comparison communities (no information meetings)

Since each community was randomly assigned to one of the Financial options and one of the Information options, there are effectively 8 subgroups altogether of (236/8=) 29 or 30 communities each. Because the random assignment to the financial options was independent of the assignment to the information option, these two components are not correlated with each other; regardless of the type of financial intervention that was assigned to a given community, it had a 50% chance of being assigned to either information intervention.

The combination of the financial intervention and the information intervention created the following experimental groups:

**Figure 2: Treatment arms**

	No financial intervention	Free access to KG	Free access + BNG7 CCT	Free access + BNG20 CCT	Total
No information	Control = 30 communities	T2 = 29 communities	T4 = 30 communities	T6 = 29 communities	118 communities
Information and mediation campaign	T1 = 29 communities	T3 = 30 communities	T5 = 29 communities	T7 = 30 communities	118 communities
Total	59 communities	59 communities	59 communities	59 communities	236 communities

## Data Collection

**A baseline Community Listing survey was carried out in April 2014 to collect information on the communities and the kindergartens.** In each eligible community, the mayor was interviewed, the kindergarten director, and a community leader. Basic community and kindergarten information was collected.

**The baseline survey was conducted by OSI in April-May 2014 and covered the 5,772 households with eligible children across the 236 communities.** This followed the “Community Listing Exercise” in April 2014 described above. For those communities with more than 25 eligible households, the enumerators selected the households through a random walk. All participating parents provided written consent. The baseline survey captured information on demographics, education, and employment of all household members, including information on literacy and numeracy, as well as information on child rearing/interaction practices and attitudes toward parenting and education. It also included information on assets and dwelling characteristics. There were 427 refusals.

**The endline survey was conducted by OSI in April-May 2015 and covered 5,158 of the 5,772 baseline households, equivalent to an attrition rate of less than 11%.** The appendix provides details on the follow up success separately for each of the treatment and comparison groups.



**Finally, three unannounced kindergarten attendance checks were carried out by OSI during April-May 2015 covering all eligible children.** During these checks, someone from the OSI team would make an unannounced visit to the kindergarten and verify which children were present and which children were not.

## Indicators of Interest

The impact indicators of interest fall into **five categories**:

1. parental perceptions of kindergarten,
2. participation to kindergarten,
3. parental involvement in educational activities,
4. household employment, and
5. child learning and development.

Regarding **parental perceptions**, we first use indicators of the perceived benefit of kindergarten by asking parents how certain they are that their child will complete primary school / complete secondary school / be bullied in primary school / will be treated with respect by teachers in primary school if (1) their child completes kindergarten, and (2) their child does not complete kindergarten. We also use measures of aspirations by asking parents what the appropriate age is to stop education, get married, and have children.

Regarding **participation in full-day kindergarten**, we use two indicators of whether the child is registered, one using kindergarten registers and the other one using survey data. The survey also provides an indicator of whether the child ever attended full-day kindergarten (s/he might have already dropped out), and the proportion of attended days over the past five days (0 is assigned to children who are not registered). Finally, we implemented three unannounced visits in each kindergarten to collect independent information of whether each child in our sample was present<sup>9</sup>, and we use the proportion of visits where the child was present as an indicator of attendance.

To measure **parental involvement in educational activities**, we asked parents whether they did specific activities with their child in the past three days before the survey: reading a book or looking at a picture book / telling a story / singing a song / playing with toys / naming, counting or drawing. We use indicators of whether the parent answered yes for each activity separately, as well as the proportion of activities for which the parent answered yes.

Regarding **household employment**, our main impact indicators are the number of individuals in the household who have an employment, household income from employment, and total household income. We also use indicators of whether the child caregiver is working or homemaker.

Finally, measures of **child development** are constructed using a specific questionnaire administered to the child at endline. This questionnaire is based on the tool developed in 2015 by Save the Children: International Development and Early Learning Assessment (hereafter, IDELA). In 2011, Save the Children completed a comprehensive review of the existing child development assessments and documented several important limitations with existing tools (targeting specific skill areas or a specific age group, reliant on parent or teacher report rather than directly assessing children's skills, expensive, or time-consuming). Most importantly, the majority of the existing tools had been used primarily in high income countries, such as the United States, United Kingdom and Australia, making them difficult to adapt and easily use across countries with diverse populations and resource-poor settings. Save the Children conducted in depth quantitative analysis of item functioning, internal consistency, inter-rater reliability and construct validity. With testing and input from multiple country teams over three years, the tool has resulted in 2015 in a 22-item assessment that balances the three key dimensions

9. As attendance was strategic in the conditional voucher treatment arms, self-reported attendance might have been upwardly biased in these groups relative to the other groups. We thus implemented an independent measure of attendance that is not affected by strategic attendance reporting.



discussed above: psychometric rigor, feasibility, and international applicability. Thus, IDELA is easily translated and administered in varied cultural contexts, and has strong reliability and validity<sup>10</sup>. IDELA involves four developmental areas: motor, language and early literacy, math and problem solving, and socio-emotional development. The questionnaire constitutes a core of 22 items that span the four developmental domains mentioned above. See in Appendix IV examples of items included in the IDELA questionnaire used for this project. The questionnaire was administered only once at endline, at home, by a trained enumerator. The original questionnaire was written in Bulgarian, but enumerators were told to adjust to children's preferred language. For this purpose, enumerators were selected by OSI to fit local communities.

## Design Validation

### Baseline Balance

**The baseline sample is very well balanced across all program assignment groups.** This is shown in Appendix I Table 1. Twenty-five key variables were tested, covering demographics, education, livelihoods, and parental care practices. For each of these, means were calculated for the 8 intervention sub-groups; 1 pure control and 7 groups that receive some combination of financial incentives and (no) information. Clustering error terms at the community level, a t-test is carried out between the mean of the pure control and each of these 7 groups for each of the 25 variables; i.e. 175 t-tests. In 8 out of the 287 (two-sided) t-tests, the means are significantly different (with p-values <0.10); in comparison, if these means were all randomly drawn from identical underlying distributions, we would expect nearly 17 significant differences by pure chance. The balance checks thus do not reject the assumption that each treatment group is statistically identical to the control group.

### Attrition and its Impact on Baseline Balance

**Attrition at endline was 11%**, meaning that 11% of the households who were sampled at baseline and took the baseline questionnaire could not be interviewed at endline. In general, these households were not available or not at home at the time the interviewer visited them. This attrition rate looks rather medium-low compared to what is found in the literature. Appendix I Table 2 shows attrition by treatment group. Attrition happened to be lower in the pure control group (8%) and larger in the pure information group (18%), all other groups having an attrition rate very close to 10%.

**The baseline characteristics continue to be very well balanced across all program assignment groups, considering the 5,158 of the 5,772 baseline households that were interviewed in the endline survey.** This is shown in Appendix I Table 3. Testing the same variables, we now find that in 5 out of the 175 (two-sided) t-tests, the means are significantly different (with p-values <0.10), still well below the near 30 significant differences we would expect by pure chance. So, attrition had no impact on the internal validity of the experiment: the baseline characteristics of the non-attriters look identical in all treatment groups. Consequently, the higher attrition rates in some groups relative to other groups do not affect the internal validity of the impact estimates.

Finally, **attrition did not much affect the external validity of the experiment** as the final sample has the same characteristics as the original sample. Appendix I Table 4 shows the correlation between baseline characteristics and the fact that the child was present at endline to see how attrition changed the composition of the experimental population. We find that minority children are 4 percentage points (pp) more likely to be present at endline than majority children, probably because geographical mobility is lower for minority households. Households who do not speak Bulgarian and where the parent cannot write a simple text at baseline were also respectively 3 pp and 4 pp more likely to be present at endline, probably for the same reason. The other correlations are smaller and marginally significant. Overall, the final sample is a bit more disadvantaged than the original sample but the differences are not large.

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10. Pisani, Lauren, Ivelina Borisova, and Amy Jo Dowd, "International Development and Early Learning Assessment Technical Working Paper", Save the Children, March 2015.

## Determining Program Impacts

### Main Impacts

The basic statistical model described in Equation 1 provides intention-to-treat (ITT) program impact estimates: it regresses the outcome  $Y_{ivc}$  for child  $i$  in settlement  $v$  in stratum  $c$  on binary variables that equal 1 for households in this treatment and 0 for the other households:

**Equation 1:** 
$$Y_{ivc} = \alpha + \beta_1 Information_{vc} + \beta_2 FreeAccess_{vc} + \beta_3 FreeAccess\_and\_info_{vc} + \beta_4 BGN7_{vc} + \beta_5 BGN7\_and\_info_{vc} + \beta_6 BGN20_{vc} + \beta_7 BGN20\_and\_info_{vc} + \beta_8 BaselineY_{ivc} + \gamma_c + \epsilon_{ivc}$$

The key coefficients are  $\beta_1 - \beta_7$  which represent the differences between each experimental group and the control group. Appendix VII offers another perspective on the impacts of the interventions which focuses on the impacts of each component of the interventions (information, free access, 7 BGN incentive, 20 BGN incentive) independently from the other components.

The basic model also controls for strata fixed effects  $\gamma_c$  and a set of baseline control variables  $BaselineY_{ivc}$  to improve the precision of the impact estimates. The baseline control variables are: age of the child, gender of the child, language, household size, employment of household head, household income, parental involvement in activities with the child, child is registered in kindergarten at baseline, level of education of parents, single parent household, presence of books in house, and expectations of parents about kindergarten and about future educational attainment. The standard errors allow for non-independence in error terms (clustering) within a settlement.

### Heterogeneous Impacts

Following the research proposal that was approved by SIEF in 2013, we also examined whether the treatment impacts vary depending on whether the household is Roma or Bulgarian. Measuring ethnicity is not straightforward since some Roma or Turkish households tend to hide their ethnicity due to social image concerns. In this study, we thus favor a measure of ethnicity which is reported by the interviewers instead of self-reported by the households. In our sample, 13% of the households were identified by interviewers as Bulgarian, another 13% as Turkish, and the remaining 74% as Roma. We consider two groups: Bulgarian (“majority”) on the one hand, and Roma or Turkish (“minority”) on the other hand.

For each characteristic  $S$  (already included in the set of baseline control variables  $BaselineY_{ivc}$ ), the statistical model is:

**Equation 2:** 
$$Y_{ivc} = \alpha + \beta_1 Information_{vc} + \beta_2 FreeAccess_{vc} + \beta_3 FreeAccess\_and\_info_{vc} + \beta_4 BGN7_{vc} + \beta_5 BGN7\_and\_info_{vc} + \beta_6 BGN20_{vc} + \beta_7 BGN20\_and\_info_{vc} + \beta_8 Minority_{ivc} + \beta_9 Information_{vc} * Minority_{ivc} + \beta_{10} FreeAccess_{vc} * Minority_{ivc} + \beta_{11} FreeAccess\_and\_info_{vc} * Minority_{ivc} + \beta_{12} BGN7_{vc} * Minority_{ivc} + \beta_{13} BGN7\_and\_info_{vc} * Minority_{ivc} + \beta_{14} BGN20_{vc} * Minority_{ivc} + \beta_{15} BGN20\_and\_info_{vc} * Minority_{ivc} + \beta_{16} BaselineY_{ivc} + \gamma_c + \epsilon_{ivc}$$

The coefficients  $\beta_1 - \beta_7$  are the estimated difference in outcome for majority children, while  $\beta_8 - \beta_{15}$  are the *additional* estimated difference in outcome for minority children. For instance, the impact of being offered free access for majority children is  $\beta_2$ , while the impact of being offered free access for minority children is  $\beta_2 + \beta_{10}$ . If  $\beta_{10}$  is not significant, it means that the impact on minority children is statistically similar to the impact on majority children. Impacts by ethnicity are presented in Appendix III Tables 1-7.

Finally, we test two explanations for the specific impact of the treatments on child development for minority children. One explanation may be the language spoken at home (based on parent declaration). 63% of sampled children do not speak Bulgarian at home, while 36% do (0.5% do not declare the language spoken at home and are dropped from the analysis when it uses this variable). Children who do not speak Bulgarian at home are essentially a subgroup of minority children (only 5% of children who do not speak Bulgarian at home belong to the majority group, which may reflect errors in ethnicity declaration). Therefore, Appendix IV Table 1 presents the

impact estimates for three groups: majority children (coefficients  $\beta_1 - \beta_7$ ), minority children who speak Bulgarian at home (coefficients  $\beta_1 - \beta_7 + \text{coefficients } \beta_8 - \beta_{15}$ ), and (minority) children who do not speak Bulgarian at home (coefficients  $\beta_1 - \beta_7 + \text{coefficients } \beta_8 - \beta_{15} + \text{coefficients } \beta_{17} - \beta_{23}$ )<sup>11</sup>.

Another explanation for the specific impact of the treatments on child development for minority children may be the intensity of segregation measured by the proportion of minority children in the community, as a proxy for kindergarten quality. We define a community as “segregated” when more than 4 households in 5 belong to the minority group. According to this definition, 76% of the sampled communities are segregated, while 24% are not. By construction, children living in segregated communities are essentially a subgroup of minority children (only 7% of children in segregated communities belong to the majority group). Therefore, Appendix IV Table 2 presents the impact estimates for three groups: majority children (coefficients  $\beta_1 - \beta_7$ ), minority children in mixed communities (coefficients  $\beta_1 - \beta_7 + \text{coefficients } \beta_8 - \beta_{15}$ ), and (minority) children in segregated communities (coefficients  $\beta_1 - \beta_7 + \text{coefficients } \beta_8 - \beta_{15} + \text{coefficients } \beta_{17} - \beta_{23}$ )<sup>12</sup>.

11. We do not interact ethnicity with language spoken at home since the subgroup “majority children who do not speak Bulgarian at home” is virtually empty.

12. We do not interact ethnicity with the dummy indicating that the community is segregated since the subgroup “majority children in segregated community” is too small.

# Results

## Overview of the Sample Population and Household Characteristics

The average age of the children at baseline was 3.9 years, and 54% were boys. Parental education levels are low. At baseline, 44% of parents had not completed primary (meaning grade 4 in the Bulgarian educational system), 35% only primary, and 21% secondary or higher. This is comparable to households surveyed as part of the 2011 UNDP/World Bank/EC Regional Roma Survey, where 19% of Bulgarian Roma aged 20 to 24 had at least completed general or vocational upper-secondary (FRA and UNDP, 2012)<sup>13</sup>. With regards to literacy, almost half reported having some difficulty reading and writing Bulgarian.

Households are poor: self-reported monthly income (from all sources) amounted to BGN 432 at baseline<sup>14</sup>. In comparison, according to the official statistics, average monthly household income in Bulgaria in 2014 was BGN 957 (National Statistics Institute, 2014).<sup>15</sup> Low incomes are consistent with low levels of employment; only 61% of household heads were employed at the time of the baseline. This figure is the same as the employment rate among the working-age population (15-64) of men found in the 2011 UNDP/World Bank/EC Regional Roma Survey (World Bank, 2012, p. 18).

While employment and parental education outcomes are nearly identical between the 2011 UNDP/World Bank/EC regional Roma survey and the 2014 baseline survey, kindergarten participation in the control group is much higher during the 2013-2014 school year: 68% of eligible children 3-6 years in control communities are reported to be registered in a kindergarten, compared with 45% of children aged 3-6 in the 2011 survey<sup>16</sup>. This may indicate that the September 2010 legal amendment providing for 2 years of compulsory preschool education (5 and 6-year-olds)<sup>17</sup> and the 2013 legal amendment conditioning the payment of child allowance for children aged 5 and 6 years on regular kindergarten attendance, were successful in substantially raising kindergarten participation.

## Program Implementation

At the endline survey, respondents were asked about their participation in and knowledge of the program in their specific community. Table 1 below shows how eligible households perceived the financial support they were offered (columns 1-3), as well as their participation in the information sessions at the kindergarten (columns 4-5).

**First, offering free access to kindergarten increases by 66 to 74 pp the proportion of respondents who report they were offered free access** (column 1). This indicates that this component of the programs was largely perceived by the households. Among communities that were not offered free access, approximately 9% report they were offered free access, which is explained by the fact that some municipalities offer free access to third child, orphans, or child of disabled parents. Among the households that were offered free access and do not report it, half report not having been aware, while the other half report not having been interested (see in Appendix VI summary statistics on the reasons for program ineffectiveness).

**Second, offering conditional financial incentive of BGN 7 or BGN 20 per month increases by 42 to 55 pp the proportion of respondents who report that there was additional financial help in the community.** Appendix VI shows that the reason why only about half of eligible households were aware of the financial incentives is twofold: 7-8% households eligible for CCT were not aware of the CCT, while the remaining proportion of non-compliers (41% on the BGN 7 group and 32% in the BGN 20 group<sup>18</sup>) were not interested in

13. <http://fra.europa.eu/en/publication/2012/situation-roma-11-eu-member-states-survey-results-glance>

14. 1 Euro = 1.9558 BGN

15. <http://www.nsi.bg/en/content/5687/annual-data>

16. None of these surveys make a distinction between full-day or half-day kindergarten, so parents might have included both while answering the question of whether the child is enrolled in a kindergarten.

17. Note that the law mandates any preschool program education, not specifically in full-day kindergarten

18. These proportions average households who were offered information sessions (columns 6 and 8) and households who were not offered information sessions (columns 5 and 7).



the voucher. This result suggests that non-compliance is mostly due to unattractiveness of the intervention or inability to comply with the condition, rather than non-implementation of the intervention.

**Table 1: Perceptions of financial support and participation in information sessions**

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Perceived there was a free access offer	Perceived there was any financial help	Perceived there was a large financial help	Attended to some information sessions	Attended to or more information sessions
Information only	-0.0173 (0.0661)	0.0279 (0.0709)	0.00824 (0.0409)	0.281*** (0.0845)	0.119** (0.0543)
Free access only	0.715*** (0.0718)	-0.0535 (0.0658)	0.0130 (0.0358)	0.200*** (0.0757)	0.0900* (0.0480)
Free + Information	0.707*** (0.0562)	-0.0216 (0.0663)	-0.000991 (0.0375)	0.630*** (0.0678)	0.470*** (0.0534)
Free + 7 Lev incentive	0.657*** (0.0666)	0.415*** (0.0830)	-0.0182 (0.0384)	0.243*** (0.0725)	0.118** (0.0550)
Free + 7 Lev incentive + Information		0.492*** (0.0637)	0.0229 (0.0324)	0.516*** (0.0723)	0.409*** (0.0529)
Free + 20 Lev incentive	0.712*** (0.0581)	0.488*** (0.0771)	0.521*** (0.0624)	0.233*** (0.0793)	0.120** (0.0586)
Free + 20 Lev incentive + Information	0.735*** (0.0616)	0.554*** (0.0768)	0.624*** (0.0582)	0.601*** (0.0689)	0.430*** (0.0558)
Observations	5,019	5,019	5,019	5,040	5,040
Strata fixed effects	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Mean of control group	0.0943	0.0943	0.00299	0.0566	0.00298

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.

**Third, with regards to the information campaign, participation of eligible households varies greatly depending on whether financial support was offered or not.** In communities, which received a financial intervention, the information campaign increased by 52 to 63 pp the proportion of households that participated in an information session (column 4), and by 41 to 47 pp the proportion of households that participated in 3 or more information sessions. By contrast, in communities that did not additionally receive a financial intervention, the information campaign increased by only 28pp the proportion of households that participated in an information session, and by 12 pp the proportion of households that participated in 3 or more information sessions.

There are two reasons for the low participation in information sessions when communities did not additionally receive a financial intervention (see Appendix VI): first, 23% of the corresponding kindergartens refused to organize such information sessions, maybe because they thought that providing information to poor families without any financial help is inappropriate. Second, the presence of a financial intervention may have boosted the interest of respondents to participate in information sessions: only 15-20% households declare they have no interest in information sessions when they receive a financial intervention, while 32% when they do not.

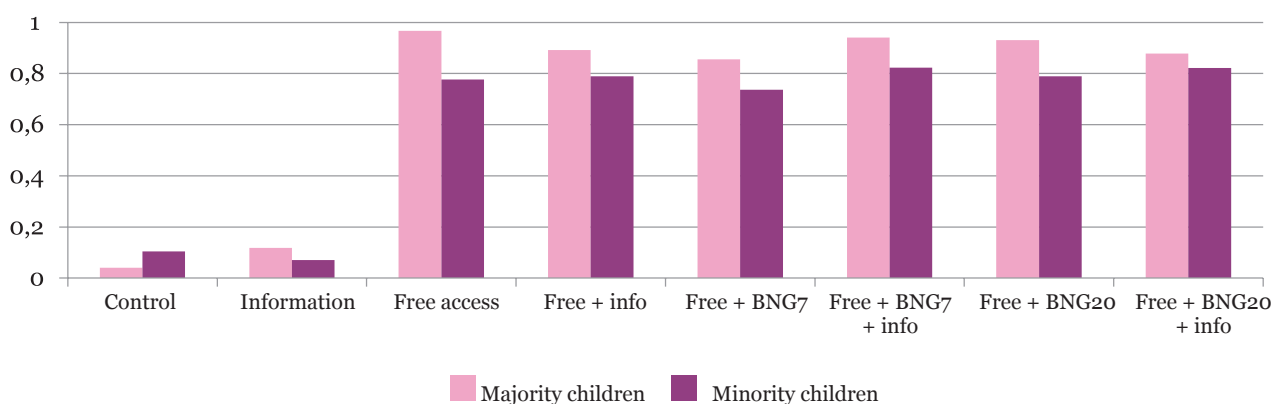
Conversely, approximately one quarter of respondents in communities that did receive financial support but *not* an information campaign reported participating in at least one session. Since the information campaign was *not* organized in these communities, respondents may have been referring to discussions that they had with the NGOs implementing the financial interventions (like the meeting announcing the lottery results), or ordinary meetings at the kindergarten.

Per Appendix III Table 1, there is clear evidence that Roma and Turkish families had significantly lower awareness of / interest in information sessions than Bulgarian families in communities that were offered financial support. Minority families were less likely to participate in the information sessions when they were associated with financial interventions than Bulgarian families (columns 4-5). For instance, while free access increased Bulgarian parents' likelihood of attending an information session by 91 pp, it only increased minority parents' likelihood of attending by 59 pp (32 pp less). In communities that were offered free access, minority families were also less likely to report that they were offered free access than Bulgarian families (column 1), but this is probably related to the fact that at baseline minority children are 14 pp more likely to be offered free access than majority children. In the end, the same proportion of minority and majority families report having free access in conditions offering free access. Notably, the effect of offering conditional financial incentive on likelihood to report being offered such, is similar for both minority and majority parents.

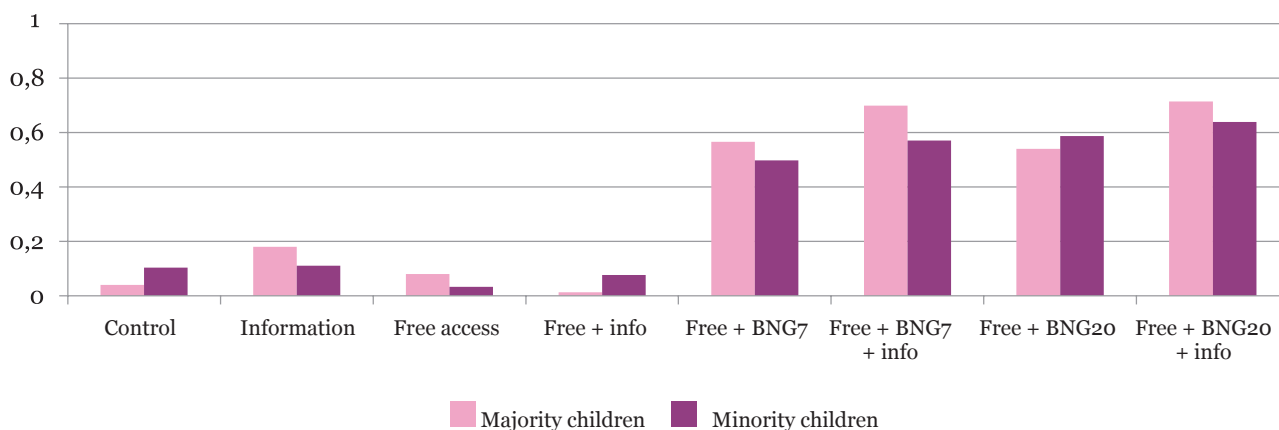
Overall, these results indicate that offering free access to kindergarten is the intervention that was the easiest to understand by all households. Offering an information campaign was not very effective in the absence of financial support, and the take-up was lower among minority families than majority families. Only half of eligible households were aware of and interested in the conditional financial incentives.

**Figure 3: Financial Treatment Effectiveness, by ethnicity**

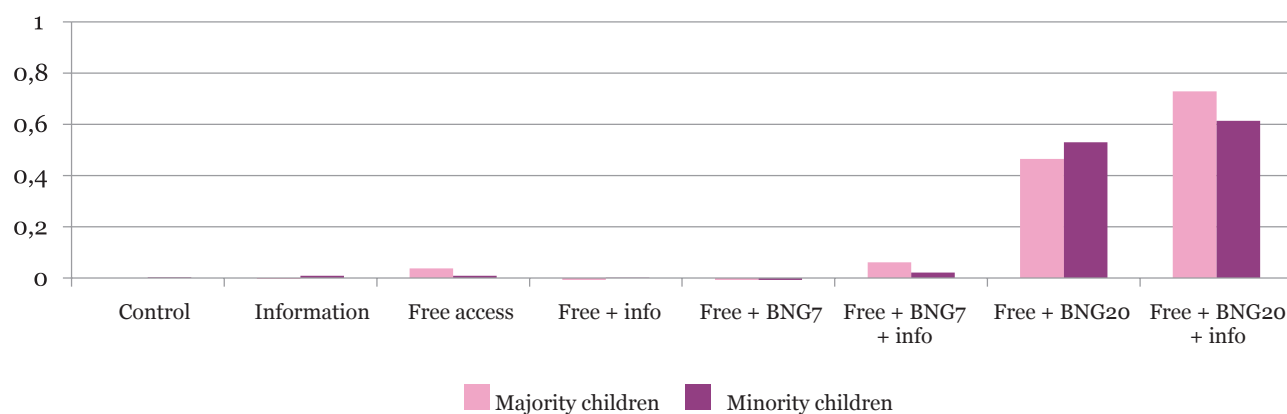
Perceived there was a free access offer



Perceived there was any financial help

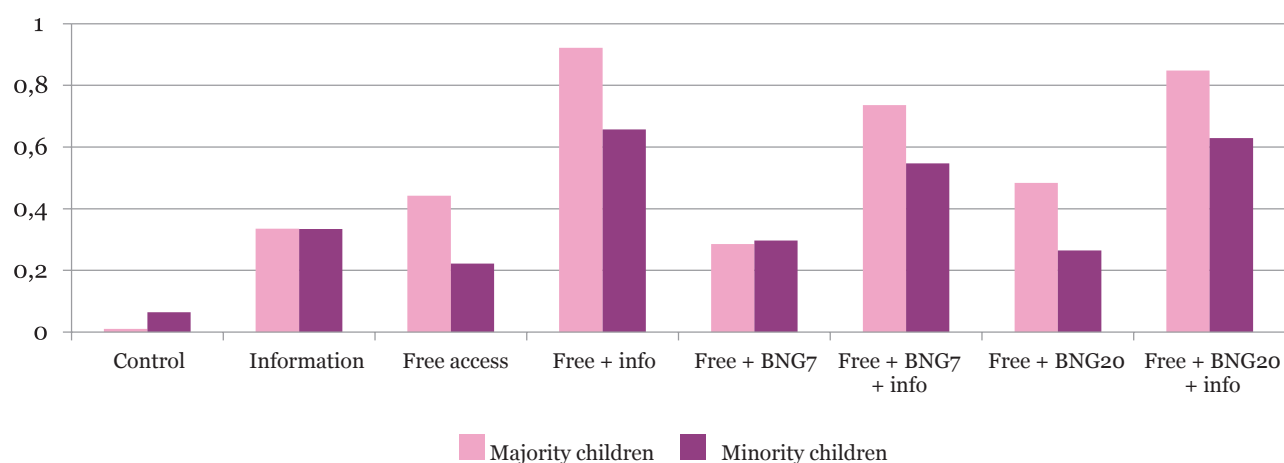


### Perceived there was a large financial help

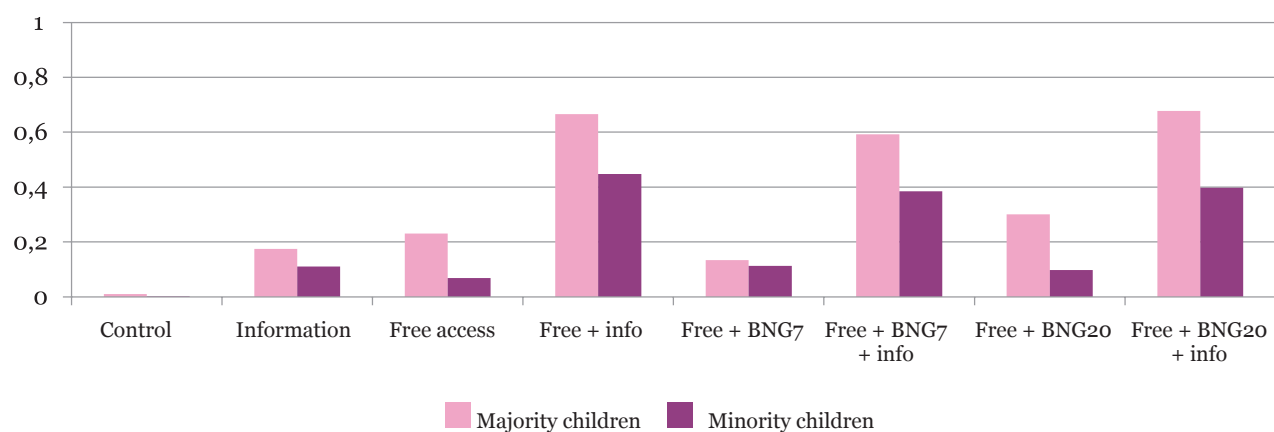


**Figure 4: Information Treatment Effectiveness, by ethnicity**

### Attended some information sessions



### Attended 3 or more information sessions



## Estimation Results

### Impacts on Kindergarten Participation

Table 2 presents the impact of the treatments on kindergarten registration and attendance. Our preferred indicators are in columns 2 and 5 as these indicators are not from parents but from school registers (column 2) and unannounced visits (column 5).

The first result is that all interventions could increase kindergarten registration. Column 2 shows that the interventions raise the share of children registered in a kindergarten by 7 to 19 pp, effectively reducing the share of children not registered by about half. Column 1 shows that free access increases the proportion of children who have ever attended kindergarten by 4 to 13 pp. This indicates that the increase in current registration comes from both a decrease in dropout, and an increase in participation from children who would never had attended kindergarten in the absence of free access. The different combinations of interventions (information, free access, and incentives) seem to have a similar impact on registration, meaning that they are mutual substitutes.

**Table 2: Impact on Kindergarten Participation**

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Ever attended preschool or kindergarten	Registered according to kindergarten registers	Registered in a Kindergarten (self-reported)	Self-reported attendance rate over the past 5 days	% of unannounced visits where child was present
Information only	0.0430 (0.0391)	0.107** (0.0510)	0.0665 (0.0414)	-0.00492 (0.0473)	0.0199 (0.0476)
Free access only	0.0740** (0.0330)	0.134*** (0.0377)	0.128*** (0.0355)	0.0899** (0.0456)	0.114*** (0.0404)
Free + Information	0.0906** (0.0415)	0.131*** (0.0384)	0.133*** (0.0409)	0.0451 (0.0456)	0.0713* (0.0372)
Free + 7 Lev incentive	0.0827** (0.0339)	0.192*** (0.0399)	0.113*** (0.0370)	0.0173 (0.0536)	0.0674 (0.0473)
Free + 7 Lev incentive + Information	0.0400 (0.0344)	0.109*** (0.0354)	0.0713** (0.0335)	0.0747** (0.0373)	0.0798** (0.0343)
Free + 20 Lev incentive	0.127*** (0.0388)	0.157*** (0.0423)	0.153*** (0.0409)	0.0950* (0.0487)	0.109** (0.0435)
Free + 20 Lev incentive + Information	0.0561* (0.0323)	0.0741** (0.0346)	0.0875** (0.0338)	0.0217 (0.0403)	0.0464 (0.0364)
Observations	5,058	4,831	5,058	4,939	5,058
Strata fixed effects	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Mean of control group	0.814	0.717	0.738	0.620	0.474

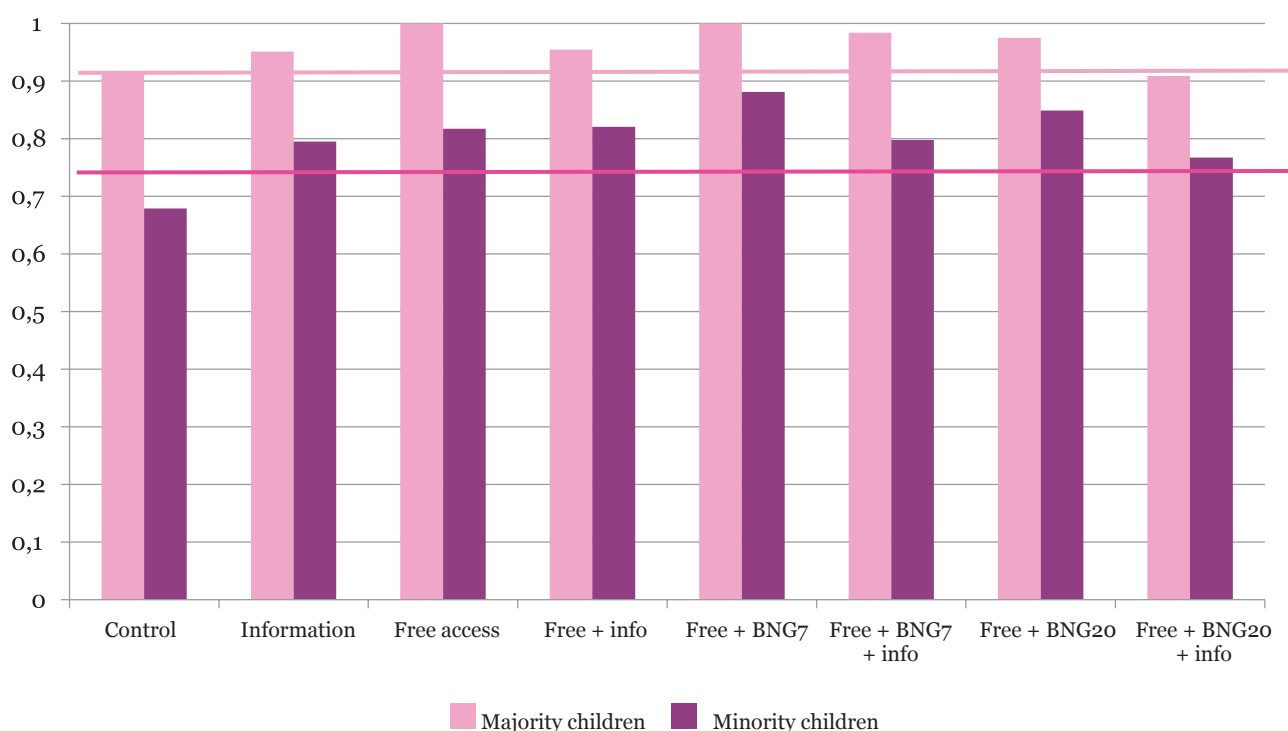
Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.

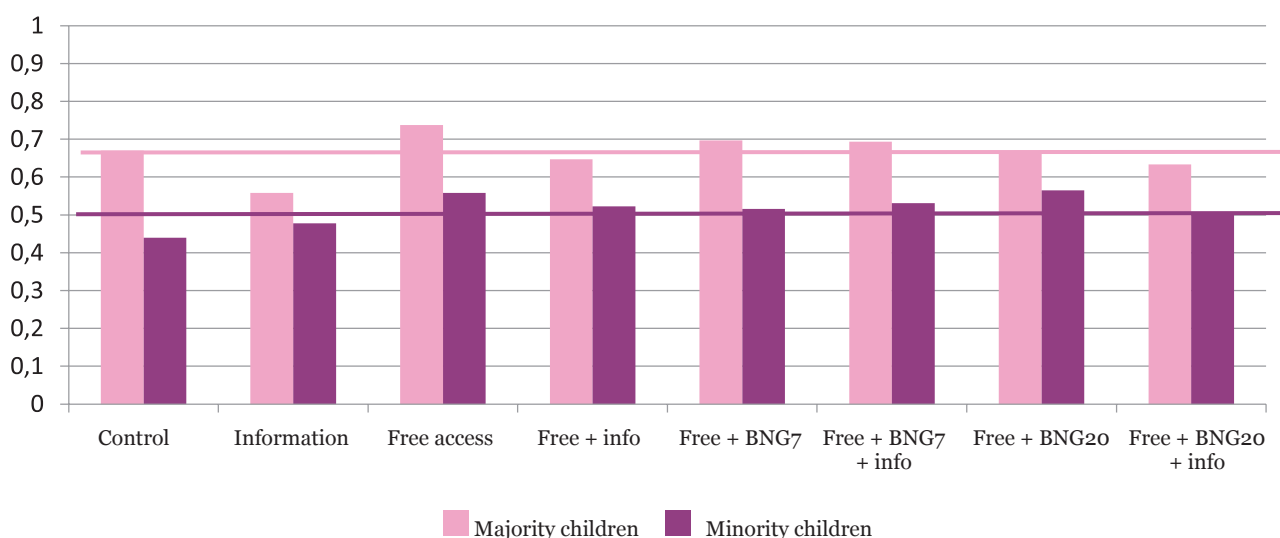


**Figure 5: Impact on Kindergarten participation, by ethnicity**

Registered according to KG registers



% of unannounced visits where child was present



Besides, **attendance also increases and the effect size is also large in all treatment groups but the information group.** Through the unannounced attendance checks (column 5), we see that the proportion of visits resulting in a presence during the three checks (regardless of registration) was 47.4% for children in the control group<sup>19</sup> and that interventions which include free access increased this proportion by 5 to 11 pp (although some estimates are not significant). This represents an increase in the attendance rate of

19. Assuming that the  $100 - 73.8 = 26.2\%$  of children not registered have 0 attendance, the 47.4% attendance rate regardless of registration implies a rate of attendance of 61% among those registered.

11 to 23%. Self-reported attendance in the last 5 days also increased significantly in some experimental groups (column 4).

Overall, there is no additional impact from the CCTs, whether this incentive is BGN 7 or BGN 20 per month, and no additional impact from the information campaign on attendance. As soon as the main financial barrier is removed, parents do increase their demand for preschool education and providing more information on the benefits of preschool education or incentives do not increase their demand further. We interpret this finding as evidence that the financial cost of kindergarten is a more important barrier than behavioral issues which are generally addressed by reasonable incentives, like time inconsistency or inattention issues. For children who remain out of school despite free access, financial incentives are too low to overcome the true additional costs of school beyond school fees, which suggest strong preferences against kindergarten. **Offering free access is thus the most cost-effective intervention to increase kindergarten participation.** Our finding that financial incentives were not efficient at increasing kindergarten participation on top of reduced costs echoes the finding in Benhassine et al. (2015) that adding conditionality to small transfers made no difference in school participation in Morocco.

In Appendix III Table 2, we see that all the effects of treatments on registration are statistically identical for Bulgarian and minority children alike. However, the impacts are different regarding attendance. Column 5 shows that the positive effects of financial treatments on attendance are mostly driven by minority children – whose baseline attendance rate at unannounced visits is smaller than for majority children (44% versus 67%). Offering free access in disadvantaged communities (combined or not with information or financial incentives) thus tends to reduce the gap between majority and minority children.

Finally, it should be noted that the treatment effects are statistically identical for girls and boys, as well as for 3/4-year-old children and 5/6-year-old children (results not shown, available upon request). This last result is surprising since by law, 5/6-year-old children should attend a preschool program whose cost should be minimal, and they already have an incentive to attend through the conditional child allowance (monthly BGN35). The fact that the impacts are identical for younger and older children may indicate that the enforcement of the law is not perfect and there is still a large margin of improvement when it comes to increasing 5/6-year-olds' participation in preschool programs. In fact, in control communities, 70% of 3 and 4-year-old children are registered in a kindergarten, while 75% of the 5 and 6-year-old children, which shows that baseline kindergarten participation is very close.

## Impacts on Parental Perceptions of Kindergarten

As shown in Table 3, **information sessions had a positive impact on average parental perceptions of the benefits of kindergarten.** The perception of how completing kindergarten will change the probability that primary school will be completed increases by 15 pp in information communities, and by 12 pp free access + BGN 20 incentive + information communities compared to control communities (column 1), suggesting that parental perception of the benefits of kindergarten increases.

These two treatments also improved parental perception of how completing kindergarten will change completion of secondary school, the incidence of bullying in primary school, and respect by teachers in primary school, although the impacts are not always precisely estimated (columns 2, 3, and 4). The other treatments had no significant effect on parental perceptions of the benefits of kindergarten.

**Table 3: Impact on Parental Perception of the Benefits of Kindergarten**

	(1)	(2)	(3)	(4)
	Gap in belief that [...] if child goes to KG versus does not go to KG			
VARIABLES	Primary school will be completed	Secondary school will be completed	Child will not be bullied in primary school	Child will be treated with respect by teachers in primary school
Information only	0.148** (0.0695)	0.0843 (0.0638)	0.105 (0.0649)	0.102 (0.0654)
Free access only	0.0474 (0.0637)	0.0338 (0.0554)	0.0584 (0.0569)	0.0560 (0.0575)
Free + Information	0.0346 (0.0651)	0.0164 (0.0607)	0.0576 (0.0614)	0.0499 (0.0611)
Free + 7 Lev incentive	0.0864 (0.0678)	0.0341 (0.0649)	-0.00191 (0.0651)	0.0276 (0.0663)
Free + 7 Lev incentive + Information	-0.0331 (0.0629)	-0.0519 (0.0560)	-0.0200 (0.0573)	-0.0149 (0.0586)
Free + 20 Lev incentive	0.0351 (0.0751)	-0.0249 (0.0703)	0.00119 (0.0708)	0.0297 (0.0704)
Free + 20 Lev incentive + Information	0.122* (0.0629)	0.0919 (0.0616)	0.125** (0.0597)	0.120* (0.0611)
Observations	5,051	5,029	5,030	5,029
Strata fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Mean of control group	0.472	0.544	0.481	0.487

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.

As per Appendix III Table 3, the change in perception in the benefit of kindergarten is larger in Roma and Turkish parents. In particular, the free access + BGN20 incentive + information treatment improved parental perception of how completing kindergarten will change completion of primary school, completion of secondary school, incidence of bullying, and respect by teachers for minority parents - but not for Bulgarian parents.

More generally, in all treatments including information campaign, the point estimates are positive and larger for minority parents than for majority parents. This suggests that the information campaign was effective in raising Roma and Turkish perceptions of the benefits of kindergarten. This may explain why minority parents who were exposed to the information campaign and financial interventions were more likely to make their children attend kindergarten than majority parents – although most differences between majority and minority parents are not statistically significant (Appendix III Table 2).

Note that parental perceptions of the benefits of kindergarten are already high: parents in the control communities estimate that the probability to complete primary school is 47 pp higher if the child complete kindergarten compared to if the child does *not*. Also, among parents in control communities, the probability to complete secondary school is 54 pp higher if the child complete kindergarten compared to if the child does *not*. These results suggest that parental awareness is already high among control households, and that there might have been little margin for improvement in that domain.

## Impacts on Parental Aspirations for their Child

Tables 4a and 4b show the impact of the interventions on the aspirations parents have for their child in terms of education and family life: how long parents would like their child to continue in education, at what age parents would like their child to get married and have children, and what level of education is considered minimum education. Table 4a presents the results for boys and Table 4b – for girls.

The treatments had some positive impacts on parental aspirations for boys, although only a few point estimates are significant (Table 4a). The impacts are more frequent in treatments which include the information campaign, suggesting that this component may be more efficient than the financial interventions to change parental aspirations.

Impressively, treatments led to increases in most beliefs about age appropriateness for girls, particularly the treatments which include the information campaign (Table 4b). Families that received only the information campaign said their girls should stop education 0.8 years later than families in the control group. Appropriate age for girls to get married also increased by 0.8 years, but this increase is not significant. The treatments combining information and financial support also had large impacts on parental beliefs about age appropriateness in almost every category for girls.

Appendix III Tables 4a and 4b indicate that these trends are more pronounced for minority families, for which baseline beliefs about age appropriateness are substantially lower than among majority families. The information campaign was thus efficient at changing slightly social norms regarding education and family life, and at reducing the gap between norms for majority and minority families. As noted above, the change in educational norms was not accompanied with a change in participation in kindergarten, neither for boys nor for girls.

**Table 4a: Impact on Parental Aspirations for their Boy**

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Appropriate age to stop education for a male	Appropriate age to get married for a male	Appropriate age to have children for a male	Secondary or more is considered minimum education for boys	Index of expectations for age appropriateness for boys
Information only	0.322 (0.350)	0.155 (0.432)	0.0807 (0.505)	0.0664* (0.0383)	0.0201 (0.102)
Free access only	0.0175 (0.298)	0.502 (0.398)	0.343 (0.495)	0.0264 (0.0416)	0.0503 (0.0939)
Free + Information	0.221 (0.295)	0.630* (0.367)	0.570 (0.434)	0.0188 (0.0406)	0.119 (0.0875)
Free + 7 Lev incentive	-0.0380 (0.327)	0.530 (0.346)	0.799* (0.415)	0.00392 (0.0393)	0.0920 (0.0881)
Free + 7 Lev incentive + Information	0.233 (0.334)	0.538 (0.438)	0.457 (0.549)	0.0430 (0.0365)	0.0710 (0.108)
Free + 20 Lev incentive	-0.289 (0.351)	-0.0672 (0.395)	-0.0490 (0.466)	-0.0284 (0.0406)	-0.0623 (0.0966)
Free + 20 Lev incentive + Information	0.0101 (0.292)	0.702* (0.385)	0.821* (0.460)	0.0498 (0.0321)	0.114 (0.0893)
Observations	4,251	4,544	4,515	5,058	4,154
Strata fixed effects	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Mean of control group	20.13	22.02	23.32	0.789	0.00896

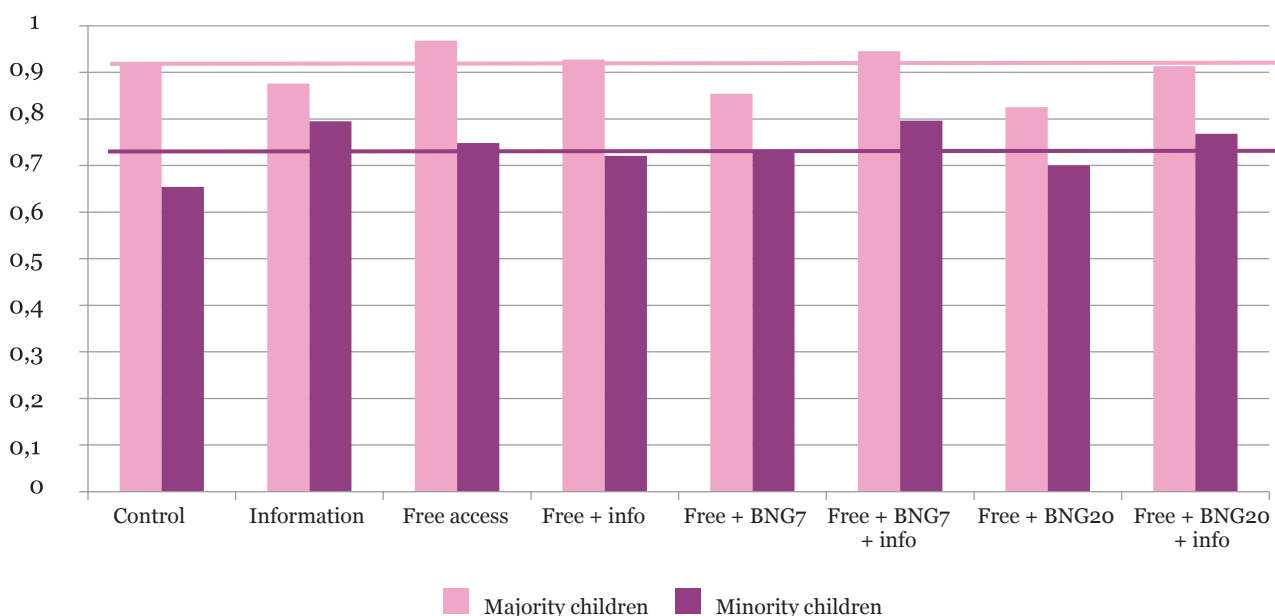


**Table 4b: Impact on Parental Aspirations for their Girl**

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Appropriate age to stop education for a female	Appropriate age to get married for a female	Appropriate age to have children for a female	Secondary or more is considered minimum education for girls	Index of expectations for age appropriateness for girls
Information only	0.806* (0.432)	0.762 (0.481)	0.447 (0.527)	0.116*** (0.0433)	0.151 (0.113)
Free access only	0.285 (0.358)	0.249 (0.419)	0.204 (0.503)	0.0915** (0.0438)	0.0368 (0.100)
Free + Information	0.626* (0.348)	0.872** (0.397)	0.777* (0.444)	0.0615 (0.0412)	0.188** (0.0935)
Free + 7 Lev incentive	0.336 (0.376)	0.723* (0.389)	0.970** (0.442)	0.0565 (0.0412)	0.150 (0.0972)
Free + 7 Lev incentive + Information	0.674* (0.367)	0.950** (0.450)	0.872 (0.544)	0.127*** (0.0412)	0.175 (0.107)
Free + 20 Lev incentive	0.172 (0.410)	0.330 (0.453)	0.106 (0.488)	0.0304 (0.0423)	0.0383 (0.106)
Free + 20 Lev incentive + Information	0.410 (0.391)	1.082** (0.447)	1.055** (0.501)	0.0985*** (0.0352)	0.197* (0.107)
Observations	4,264	4,553	4,511	5,058	4,168
Strata fixed effects	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Mean of control group	19.59	21.20	22.18	0.693	0.00374

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.

**Figure 6: Impact on educational aspirations for girls, by ethnicity****Secondary is considered minimum education for girls**

## Impacts on Household Employment

**Table 5 shows that treatments had no clear and consistent impacts on parental work and income.**

Despite greater participation in kindergarten by their children, parents may not be able to substitute child care with employment. Monthly income in column (3) includes all types of income, among which the CCT (one category of income was social transfers), whereas income from employment in column (4) does not include the CCT.

We do not find evidence that any treatment affected the proportion of primary child caregivers working (32% in the control group, unchanged in the treatment groups), nor the proportion of primary child caregivers being homemaker (39% in the control group, unchanged in the treatment groups). Total monthly income and income from employment are largely equal in all groups, although a small positive difference in the free access group and a small negative difference in the information group are present. The latter can hardly be interpreted since the time parents may have spent at the information session seems not large enough to induce a lower income from employment. Given the small number of significant differences, it seems likely that these are spurious differences due to sampling variations.

In Appendix III Table 5, we see the impacts based on ethnicity. Again, we see few significant differences, but with weak consistency.

**Table 5: Impact on Household Employment**

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Primary child caregiver is working	Primary child caregiver is homemaker	Monthly Income	Income from employment	Count of paid Working individuals in HH
Information only	-0.0554 (0.0452)	-0.0754 (0.0569)	-2.198 (11.30)	-55.46*** (18.41)	-0.216*** (0.0742)
Free access only	-0.0280 (0.0383)	-0.0276 (0.0549)	37.25*** (11.92)	23.31 (18.85)	-0.0398 (0.0722)
Free + Information	-0.0252 (0.0355)	-0.0674 (0.0510)	4.886 (8.920)	-21.19 (15.72)	-0.0537 (0.0750)
Free + 7 Lev incentive	-0.00719 (0.0382)	-0.00474 (0.0604)	9.390 (10.16)	-12.94 (17.13)	-0.0987 (0.0737)
Free + 7 Lev incentive + Information	-0.0141 (0.0373)	-0.0252 (0.0530)	6.102 (9.654)	-8.004 (18.38)	-0.0428 (0.0622)
Free + 20 Lev incentive	-0.00292 (0.0410)	-0.0305 (0.0596)	16.89 (11.37)	-4.470 (18.47)	-0.106 (0.0768)
Free + 20 Lev incentive + Information	-0.0539 (0.0328)	-0.0258 (0.0496)	14.42 (9.327)	-13.92 (15.66)	-0.124* (0.0668)
Observations	4,486	4,486	5,058	5,058	5,058
Strata fixed effects	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Mean of control group	0.321	0.388	507.4	336.4	1.061

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.

## Impacts on Parental Involvement in Educational Activities

Table 6 column 6 shows evidence that **all treatments induced a substitution away from parent provided activities with the child**. In the 3 days prior to the endline survey, parents in the control communities engaged into an average of 67.5% of activities with their child (among: reading a book, telling a story, playing with toys, singing, or naming/drawing/counting). Parental involvement in all activities is significantly lower in treatment communities. This results in a decrease in the proportion of activities done with the child by 10 to 18 pp, hence a 15 to 26% reduction.

There is no clear difference between treatments regarding this substitution away from parental investment in child education. This negative impact is consistent with the fact that treatments increase registration and attendance in kindergarten, inducing less time spent by the child in the home environment. The only puzzle is the substitution away from parental involvement in the information group, since we do not see an increase in attendance in kindergarten in this group, neither based on self-declared attendance in the last 5 days nor based on the unannounced visits. One explanation may be that parents who attended the information sessions were discouraged by the information sessions whose main goal was to excite parents about the value of kindergarten with no focus on parental activities.

**Table 6: Impact on Family Involvement in Child Education**

VARIABLES	(1) Past 3 days child got read books or looked at picture books with family member	(2) Past 3 days child got told story	(3) Past 3 days child sang with family member or got sung to	(4) Past 3 days child played with toys with family member	(5) Past 3 days family mem- ber spend time with child naming counting or drawing	(5) % of activities done with child
Information only	-0.0906 (0.0670)	-0.123** (0.0575)	-0.164** (0.0630)	-0.113* (0.0595)	-0.0951 (0.0653)	-0.117** (0.0530)
Free access only	-0.152*** (0.0565)	-0.213*** (0.0475)	-0.224*** (0.0594)	-0.158*** (0.0553)	-0.165*** (0.0568)	-0.183*** (0.0453)
Free + Information	-0.0554 (0.0613)	-0.108** (0.0521)	-0.119** (0.0564)	-0.138** (0.0601)	-0.0599 (0.0625)	-0.0960* (0.0510)
Free + 7 Lev incentive	-0.0616 (0.0558)	-0.0947* (0.0487)	-0.0927 (0.0575)	-0.185*** (0.0623)	-0.0498 (0.0606)	-0.0968** (0.0465)
Free + 7 Lev incentive + Information	-0.00924 (0.0651)	-0.0556 (0.0528)	-0.108* (0.0584)	-0.102* (0.0583)	-0.0357 (0.0597)	-0.0623 (0.0497)
Free + 20 Lev incentive	-0.0750 (0.0631)	-0.125** (0.0530)	-0.131** (0.0636)	-0.176*** (0.0624)	-0.128* (0.0658)	-0.127** (0.0513)
Free + 20 Lev incentive + Information	-0.0778 (0.0545)	-0.0988** (0.0486)	-0.0963* (0.0567)	-0.173*** (0.0575)	-0.102* (0.0582)	-0.109** (0.0461)
Observations	5,058	5,058	5,058	5,058	5,058	5,058
Strata fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Mean of control group	0.530	0.685	0.759	0.760	0.641	0.675

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.

To go further into the substitution of parental inputs with kindergarten inputs in the education of the child, columns 1 through 5 detail the impact of the interventions activity by activity. It appears that **parents are less likely to be involved in all type of activities with the child than parents in control communities**, the decrease being more pronounced for telling a story, singing, and playing with toys with family members. Effect sizes are substantial: for instance, 69% parents in control communities spend time with their child telling a story, while only 48% to 59% in the treatment communities, representing a 14 to 30% decrease.

Overall, parental participation in child education is quite important: parents in the sampled communities, although poor and segregated, get involved in activities in favour of child learning and development. Attending kindergarten should therefore be regarded as choosing a mode of education (collective and done by specialists) instead of another mode of education (private and done by non-specialists). The resulting impact on child learning and development thus depends on the relative productivity of parents and kindergartens in the education production function.

Impacts related to family involvement in child education were generally similar for minority and majority groups, as seen in Appendix III Table 6. However, the substitution away from parental activities is more pronounced among minority families for three types of activities: telling a story, singing, and playing with toys. These activities are the most prevalent activities in minority families, whereas reading a book and naming, counting, and drawing are more prevalent in majority families. For instance, only 48% of minority parents read a book to their child in the last three days, while 82% of majority parents. Conversely, 77% of minority parents sang a song to their child in the last three days, while 70% of majority parents. We generally observe greater substitution away from activities that are more prevalent in each type of family.

## Impacts on Child Learning and Development

Table 7 shows the impact of the interventions on child development outcomes. As discussed above, we use a tool for child performance assessment developed by Save the Children (IDELA) to measure cognitive and non-cognitive skills: emergent literacy (column 1), emergent numeracy (column 2), motor development (column 3), and socio-emotional skills (column 4).

**Table 7: Impact on Child Learning and Development**

	(1)	(2)	(3)	(4)
VARIABLES	% correct literacy tasks	% correct numeracy tasks	% correct motor tasks	% correct socio-emotional tasks
Information only	0.0110 (0.0319)	-0.0545** (0.0254)	0.00255 (0.0306)	-0.0177 (0.0269)
Free access only	-0.0192 (0.0288)	-0.0685*** (0.0232)	0.0389 (0.0289)	-0.0137 (0.0241)
Free + Information	0.00450 (0.0314)	-0.0352 (0.0229)	0.00464 (0.0288)	-0.0134 (0.0251)
Free + 7 Lev incentive	-0.0340 (0.0303)	-0.0206 (0.0235)	-0.0174 (0.0318)	-0.0206 (0.0262)
Free + 7 Lev incentive + Information	-0.00965 (0.0271)	-0.0237 (0.0208)	0.0671** (0.0288)	-0.00949 (0.0227)
Free + 20 Lev incentive	-0.00952 (0.0324)	-0.0193 (0.0248)	0.0125 (0.0335)	0.00538 (0.0274)
Free + 20 Lev incentive + Information	-0.0246 (0.0299)	-0.0573*** (0.0202)	0.0388 (0.0288)	-0.0195 (0.0230)
Observations	4,948	4,948	4,923	4,948
Strata fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Mean of control group	0.438	0.591	0.464	0.479



Robust standard errors in parentheses \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.

We find that **treatments led to no gain in child development** compared to the control group. Children in treatment groups achieve less in terms of emergent numeracy than children in the control group: all coefficients are negative and the coefficients for information (T1), free access (T2), and free access + BGN20 incentive + information (T7), are statistically significant. There is no consistent and significant difference in literacy, motor skills, or socio-emotional skills between treatment and control children. These results are surprising given that all treatments (except information only T1) led to a significant increase in kindergarten participation. It indicates that the additional kindergarten participation was not associated with any gain in terms of child development in the short-run (one year).

A natural question is whether a one-year period is a too short period for the benefits of kindergarten on child development to appear. Therefore, the first recommendation of the current research is to **follow the impact of providing free access to kindergarten in the longer term, in particular once kindergarten education will be completed**, in order to estimate the effects on educational performances at the end of kindergarten and in primary school.

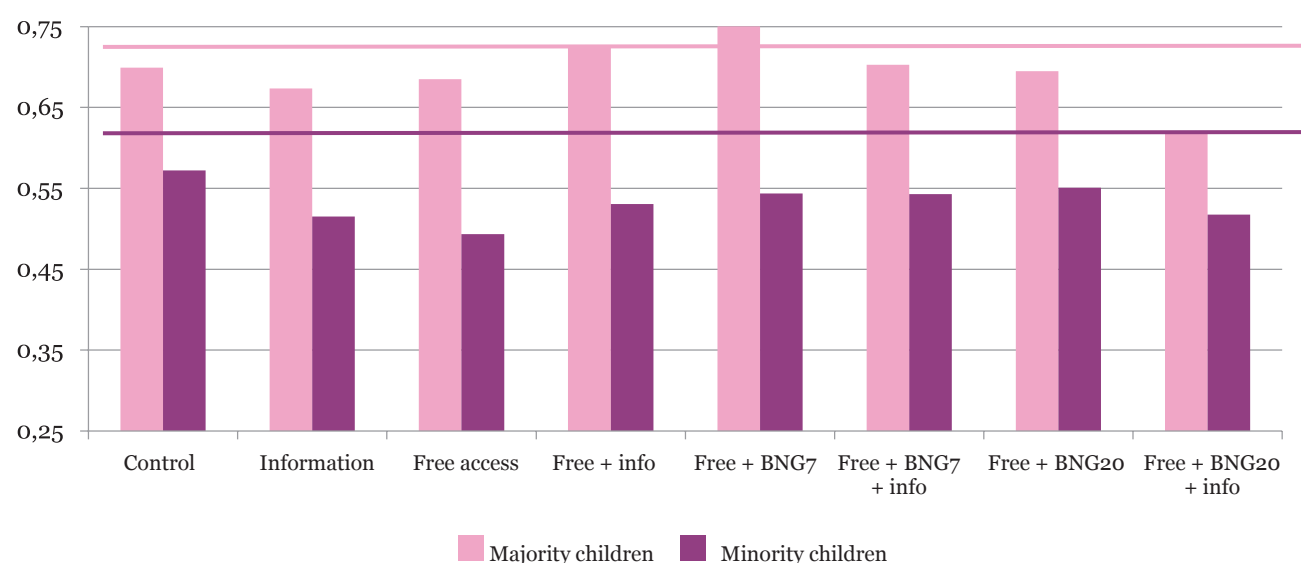
Besides, **it may be that kindergarten curriculum focuses on skills that are not measured by the IDELA questionnaire**. For instance, Bulgaria's governmental standards discourage the teaching of numbers and letters throughout kindergarten, and favor more free play, drawing, telling stories or songs, which may have larger long-term effects. However, it should be noted that our measures of child development do not focus on "academic" skills since they largely incorporate fine and gross motor skills, as well as socio-emotional skills. Moreover, our measure of emergent literacy is broader than letter identification since it incorporates items like listening comprehension and print awareness, which are closely related to being read stories and books. The quality and comprehensiveness of the IDELA tool make it unlikely that a major gain in child development would not be detected in our study.

The impact of the interventions on child development is generally similar for boys and girls, as well as for 3-4-year-old and 5-6-year-old children (results not shown, available upon request). However, as shown in Appendix III Table 7, it is important to notice that the impacts on child development are very different by ethnicity. The impacts of financial treatments are **nil or positive for Bulgarian children, whereas they are significantly negative for minority children**. Bulgarian children in financial treatment communities perform similarly (numeracy and motor tasks) or better (socio-emotional and literacy skills) than Bulgarian children in control communities (although the differences are rarely significant except for socio-emotional skills); in contrast, Roma and Turkish children in financial treatment communities perform worse than Roma and Turkish children in control communities. These differences are, in some cases, substantial: regarding socio-emotional skills, majority children do 5 to 15 pp *better* than majority children in control communities, while minority children do 3 to 5 pp *worse* than minority children in control communities. We do not find any difference in motor skills, but there are also some negative impacts on emergent literacy and emergent numeracy for minority children.

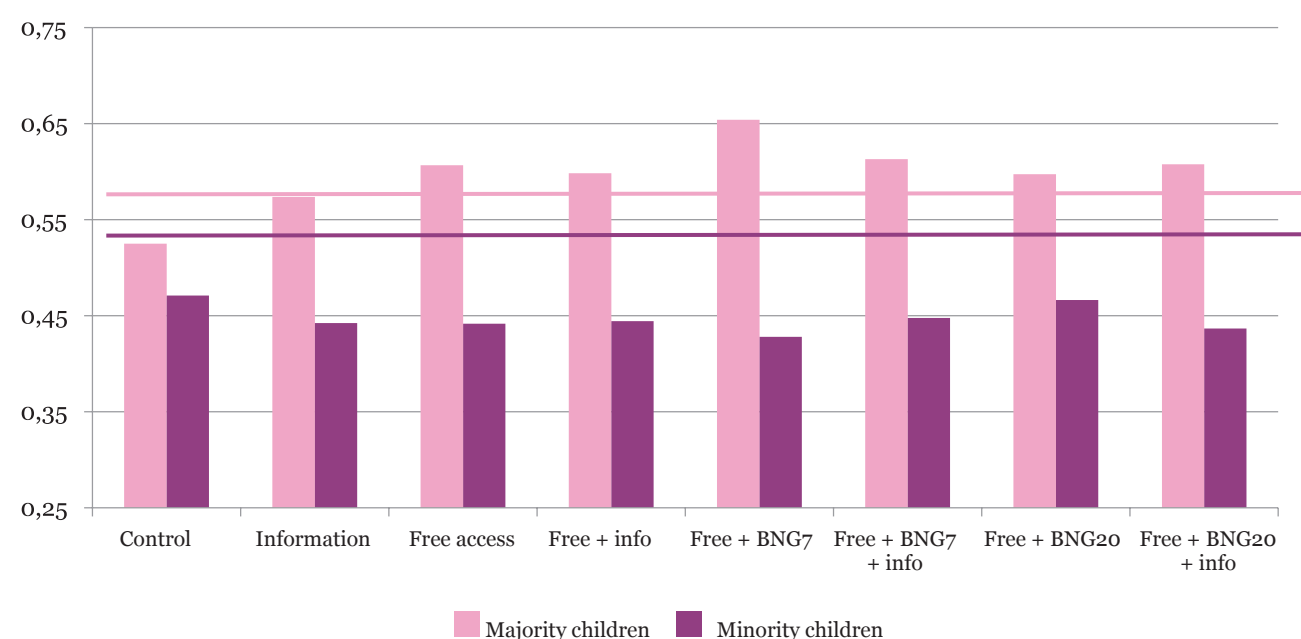
The fact that the impacts are observed only in financial treatment groups is consistent with the fact that only *financial* treatments increased attendance in kindergarten. Importantly, the negative impact is observed on minority children who respond more to the financial treatments in terms of kindergarten participation. It means that for minority children, an increase in kindergarten participation was associated with a decrease in socio-emotional skills and, to a lesser extent, in emergent numeracy. These results provide evidence that full-day kindergartens immediately benefit (although not dramatically) Bulgarian children, while Roma and Turkish children do not. The results from Bulgaria PISA 2012 show that attending at least two years of preschool education raises low achievers' scores, including those of the Roma and Turkish children, which suggests that a longer-term study may raise more positive findings about the effect of providing free access to kindergarten on child development.

**Figure 7: Impact on emergent numeracy and socio-emotional skills, by ethnicity**

% correct numeracy tasks



% correct socio-emotional tasks



However, in the first year, minority children development is greater when they are not encouraged to participate in kindergarten than when they are encouraged. What are the potential explanations for this negative impact of full-day kindergarten on minority children's development?

First, **the role of families on child development should not be neglected.** As shown in Appendix III Table 6, parental involvement in educational activities is substantial even in minority families: minority parents in the control settlements report that they did an average of 65.8% of the activities listed in our questionnaire over a period of 3 days. Parental involvement is larger among Bulgarian families (they did an average of 77.4% of these activities), but still substantial among minority parents. Therefore, we cannot take as granted that minority parents do not invest time for educational activities with their children. Besides, classes are big relative to families, so one teacher can hardly interact with each child as much as parents and siblings at home. Finally, the fact that most parents in our sample are low educated does not mean that they are unable to stimulate young-child

development: at the very early stages of child development, even low-educated parents may be able to provide their child with basic knowledge like counting and identifying letters since this does not require high parental education. This is particularly true for the development of socio-emotional skills which require no academic skills but a stable and confident interpersonal relationship. Therefore, it may be that the lower parental involvement in educational activities associated with providing free access to kindergarten has a negative effect on child development.

Second, a complementary explanation may be that the **quality of kindergarten** in our sample may be low relative to the average kindergarten, which may explain the lower performances of minority children who were offered free access. We do not have yet sufficient data on kindergarten quality to test directly this hypothesis. Ideally we will need information on teacher experience, teacher levels of education, quality of kindergarten equipment and furniture, etc. However, quality of kindergarten would not explain the differential impact of providing free access on majority and minority children unless kindergarten quality is strongly correlated with the proportion of majority versus minority children in the kindergarten. For instance, if most majority children are enrolled in normal quality kindergarten while most minority children are enrolled in poor quality ones, this would lead to offering free access is positive on majority children but negative on minority children. To test this possibility, we look at treatment effects by levels of segregation: if the poor quality of the kindergarten is the reason why minority children achieve less in treatment groups than in the control group, then the impact of treatments on minority children in non-segregated kindergarten should be better than the impact of treatments on minority children in segregated kindergarten.

Appendix IV Table 2 shows that offering free access had a **negative impact on socio-emotional skills and emergent numeracy of minority children even when these children attend a non-segregated kindergarten**. The negative impacts are more pronounced in segregated kindergartens (most coefficients on treatments interacted with segregated kindergarten are negative), but most of the negative impacts of offering free access appear already on minority children who attend a non-segregated kindergarten, as shown by the negative coefficients on treatments interacted with minority ethnicity.

A third explanation for the fact that offering free access has a negative impact on minority children development is that **a large proportion of minority children, 72%, do not speak Bulgarian at home**. The language of instruction in the kindergarten is Bulgarian. The fact that kindergartens specifically fail to improve development of minority children in the first year may thus come from the fact that children who do not speak Bulgarian at home need to adjust in a bilingual environment, which represents an obvious source of difficulty relative to children who speak Bulgarian. In Appendix IV Table 2, we consider both dimensions together: ethnicity and spoken language. The impact of offering free access can be seen on minority children independently from their language.

We find that ethnicity is a disadvantage in its own right: the negative effect of providing free access to kindergarten is **more pronounced for minority children who do not speak Bulgarian at home, but ethnicity is a clear disadvantage in its own right**. The detrimental impact of offering free access on socio-emotional skills is strong, independently from children's first language. This result suggests that the language itself adds to the difficulty that children face in adapting to the kindergarten environment, but does not explain entirely the negative impact of providing free access to kindergarten for minority children.

Overall, **these results question how minority children are treated in the kindergartens** and to what extent it is difficult for them to adjust to a new – strange – environment. Qualitative feedback from kindergarten directors suggests that teachers find it more difficult to work with groups of children of different ethnic origin because the usual way of teaching is not well-adapted to minority children. Adaptation to kindergarten is easier for Bulgarian children who already “know how to put on shoes or use toilets” for instance, while for minority children it may represent a shock and put them under stress. The environment in kindergarten is currently not structured to meet the specific needs of minority children, leading to no gains in cognitive development.

# Conclusions and Policy Recommendations

The conclusions that we can draw from this large-scale multi-arm experiment in Bulgaria are three-fold.

First, **offering free access to Kindergarten is the most cost-efficient strategy to encourage participation of disadvantaged children in Kindergarten.** We find that the free access intervention component significantly increased kindergarten registration and attendance, reducing by half the proportion of children that are not registered, and increasing by about 20% daily attendance rate. In contrast, neither the additional conditional financial incentives nor the additional information sessions increased further kindergarten participation. Free access to kindergarten is the most natural way to lower the monetary costs of early education and remove the affordability barrier to early education. The results show that offering free access led to a significant increase in participation. The conditional financial incentive increases the direct utility from having a child at kindergarten since it provides an additional disposable income to the household, but it requires complying with the attendance requirement. As the average child in control communities that is registered at the kindergarten attends 71% of the time, fulfilling compliance with the conditional financial incentives would have required an important shift in behavior and neither the BGN 7 nor BGN 20 may have been large enough to induce this. It should also be noted that these conditional financial incentives were offered on top of the child allowances paid by the government, conditioned on attendance for the children aged 5 and 6 years and paid unconditionally for children below that age. Besides, we find that parents do not participate much in the information campaign when it is not combined with financial support, and that the information campaign alone does not encourage higher attendance in kindergarten, showing that this component itself is not sufficient. Overall, the best strategy to increase kindergarten participation among children from disadvantaged areas in Bulgaria is thus to remove kindergarten fees for parents and other hidden costs.

Second, **the information campaign has some positive impacts on parental perceptions of the benefit of kindergarten and aspirations for their child which are interesting per se**, even if these changes do not lead to increased participation in kindergarten. The information campaign was intended to help parents better understand the returns of kindergarten education and increase their perception of expected benefits. During the endline survey, respondents reported larger differences in the likelihood that someone who completed kindergarten will – later in life – be able to complete primary and secondary school, and be treated with respect by peers and teachers, compared with someone who does not complete kindergarten. Moreover, the information campaign raised parents' aspirations for their child, especially for girls. If these changes do not affect immediate participation in kindergarten, it may have longer-term effects on later decisions – if changes in parental perceptions are durable, which cannot be tested in this experiment. Since the cost of the information campaign is quite small, combining free access to kindergarten with the information sessions may be optimal to induce not only present participation in kindergarten but also longer term changes in parental attitudes.

Third, **a concern arises from this experiment about the one-year impact of kindergarten participation on cognitive and non-cognitive development of minority children.** After one year, we find no impact of offering free access on the development of the average child, which results from the combination of a positive impact on majority children with a negative impact on minority children compared to similar children in control communities. In fact, an increase in kindergarten participation was associated with some skill improvements for Bulgarian children, while lower emergent numeracy and socio-emotional skills for Roma and Turkish children. Further analysis and qualitative feedback suggest that this may be primarily due to low readiness of kindergartens to accept and create a low-stress transition to school environment for minority children. Our policy recommendations are therefore the following:



- Remove kindergarten fees and eliminate the possibilities for kindergartens to collect additional resources from parents
- Combine free access to kindergarten with information and mediation sessions to raise parental perceptions of the benefit of education and aspirations for their child, and emphasize parental role in child development
- Develop (and evaluate the impact of) measures to improve the on-boarding of ethnic minority children into kindergarten, which includes several options like:
  - Specialized trainings for teachers and directors to develop appropriate teaching methods and inclusive attitudes
  - Mediators to help minority kids and their families to cope with the mainstream educational system and facilitate mutual understanding between kindergarten staff and families
- Continue the research to follow the impact of providing free access to kindergarten in the longer term, especially once kindergarten education is completed

# Appendices

## Appendix I: Checking Baseline Balance and Attrition

Appendix I Table 1: Balance checks for households interviewed at baseline

Table A1. Family Characteristics and Balance check

	Child is female	Age of the child	Child is Roma or Turkish	Child does not speak Bulgarian at home	Size of household	Head unemployed	Primary caregiver is home-maker	Income in the first quintile	Income in the second quintile	Income in the third quintile	Income in the fourth quintile	Income in the fifth quintile
Information only	0.045 (0.029)	-0.044 (0.073)	0.006 (0.058)	-0.003 (0.089)	0.335** (0.162)	0.035 (0.038)	-0.074 (0.068)	0.065 (0.045)	0.045 (0.032)	0.004 (0.025)	-0.053 (0.037)	-0.062 (0.037)
Free access only	0.031 (0.027)	0.031 (0.073)	0.003 (0.062)	0.033 (0.085)	0.138 (0.156)	-0.026 (0.043)	-0.024 (0.063)	-0.020 (0.044)	0.007 (0.037)	0.032 (0.036)	-0.052 (0.040)	0.033 (0.043)
Free + Information	0.019 (0.028)	-0.097 (0.069)	0.031 (0.063)	0.033 (0.090)	0.235 (0.144)	0.008 (0.040)	-0.002 (0.071)	0.084* (0.046)	0.046 (0.031)	-0.005 (0.025)	-0.072* (0.039)	-0.053 (0.036)
Free + 7 Lev incentive	0.042 (0.031)	-0.035 (0.066)	0.088 (0.056)	0.034 (0.089)	0.052 (0.164)	0.005 (0.045)	-0.046 (0.074)	0.071 (0.044)	0.067** (0.029)	-0.021 (0.025)	-0.078** (0.036)	-0.038 (0.042)
Free + 7 Lev incentive + Information	0.042 (0.030)	0.020 (0.074)	0.074 (0.056)	0.117 (0.084)	0.360** (0.156)	0.032 (0.035)	0.082 (0.070)	0.016 (0.039)	0.064** (0.032)	-0.017 (0.024)	-0.050 (0.037)	-0.014 (0.039)
Free + 20 Lev incentive	-0.006 (0.027)	-0.003 (0.068)	0.052 (0.054)	0.089 (0.084)	0.203 (0.164)	0.036 (0.037)	0.098 (0.072)	0.031 (0.038)	0.037 (0.030)	0.033 (0.024)	-0.061* (0.035)	-0.041 (0.032)
Free + 20 Lev incentive + Information	0.017 (0.027)	0.012 (0.065)	0.008 (0.060)	-0.068 (0.092)	0.207 (0.165)	-0.012 (0.038)	0.002 (0.063)	0.034 (0.044)	0.038 (0.033)	-0.008 (0.025)	-0.043 (0.036)	-0.021 (0.034)
Observations	5,772	5,772	5,732	5,729	5,772	5,243	5,243	5,772	5,772	5,772	5,772	5,772
R-squared	0.001	0.002	0.006	0.013	0.006	0.003	0.013	0.007	0.003	0.002	0.003	0.005
Mean in the control group	0.460	3.895	0.756	0.623	4.448	0.779	0.388	0.168	0.176	0.183	0.255	0.218

Notes: Data from baseline survey. Estimates from an OLS regression. \* Significance at 10% level. \*\* Significance at 5% level. \*\*\* Significance at 1% level. Standard errors clustered at the community level.

Table A1. Family Characteristics and Balance check (continued)

	Toilets in the house	Bath-room in the house	Internet connection in the house	Parent completed primary education	Parent has no problem to write a simple text	Parent cannot write a simple text	Family does not have a child	Child registered in a pre-school program	Walking distance from a KG: less than 15 minutes	Number of employees in the KG	Number of groups in the KG	Number of children enrolled	Segregated KG = at least 4 minority children in 5 in the catchment area
Information only	-0.087 (0.062)	-0.040 (0.072)	-0.063 (0.062)	-0.094 (0.071)	0.000 (0.083)	0.036 (0.037)	0.016 (0.051)	0.028 (0.064)	0.026 (0.068)	-2.404 (2.589)	-0.639 (0.557)	-22.238 (15.421)	0.062 (0.131)
Free access only	0.032 (0.065)	0.048 (0.070)	-0.011 (0.063)	-0.076 (0.071)	-0.039 (0.086)	0.043 (0.044)	0.008 (0.042)	0.045 (0.072)	-0.044 (0.072)	3.442 (2.626)	0.860 (0.576)	17.880 (15.968)	0.090 (0.128)
Free + Information	-0.064 (0.062)	-0.057 (0.073)	-0.062 (0.062)	-0.086 (0.065)	-0.021 (0.084)	0.025 (0.038)	-0.006 (0.042)	0.038 (0.064)	0.011 (0.076)	-0.909 (3.088)	-0.133 (0.708)	-3.972 (19.903)	0.027 (0.130)
Free + 7 Lev incentive	-0.061 (0.063)	-0.055 (0.068)	-0.079 (0.059)	-0.077 (0.061)	0.027 (0.080)	0.031 (0.039)	0.019 (0.041)	0.006 (0.061)	-0.025 (0.073)	0.180 (2.838)	-0.061 (0.669)	-4.482 (17.494)	0.197 (0.122)
Free + 7 Lev incentive + Information	-0.065 (0.060)	-0.066 (0.072)	-0.057 (0.060)	-0.062 (0.066)	0.024 (0.082)	0.018 (0.036)	-0.018 (0.038)	0.008 (0.067)	0.037 (0.075)	-1.580 (2.435)	-0.460 (0.544)	-22.522 (14.403)	0.167 (0.125)
Free + 20 Lev incentive	-0.078 (0.058)	-0.030 (0.067)	-0.038 (0.058)	-0.041 (0.067)	0.043 (0.084)	0.045 (0.038)	-0.032 (0.035)	0.069 (0.064)	-0.074 (0.065)	-0.434 (2.662)	-0.248 (0.571)	-4.594 (17.718)	0.002 (0.131)
Free + 20 Lev incentive + Information	0.006 (0.062)	0.027 (0.071)	-0.049 (0.055)	0.044 (0.063)	0.024 (0.080)	0.019 (0.032)	-0.003 (0.039)	0.021 (0.067)	-0.019 (0.069)	2.395 (2.535)	0.057 (0.580)	8.498 (17.214)	0.095 (0.127)
Observations	5,738	5,74	5,736	5,202	5,225	5,225	5,675	5,743	5,772	5,695	5,72	5,722	5,772
R-squared	0.009	0.006	0.003	0.008	0.003	0.002	0.003	0.002	0.005	0.027	0.028	0.034	0.020
Mean in the control group	0.314	0.490	0.352	0.567	0.531	0.087	0.103	1.323	0.401	17.344	4.040	106.234	0.539

Notes: Data from baseline survey. Estimates from an OLS regression. \* Significance at 10% level. \*\* Significance at 5% level. \*\*\* Significance at 1% level. Standard errors clustered at the community level.

**Appendix I Table 2: Attrition – (Not) interviewed at endline**

	Not found in endline	Found in endline	Total
Control & No Info	54	672	726
Control & Info	103	570	673
Free access & No Info	64	657	721
Free access & Info	69	660	729
Seven lev & No Info	90	617	707
Seven lev & Info	99	643	742
Twenty lev & No Info	65	688	753
Twenty lev & Info	70	651	721
<b>Total</b>	<b>614</b>	<b>5158</b>	<b>5772</b>

# Appendix I Table 3: Balance checks for households interviewed at endline

Table A3. Family Characteristics and Balance check

	Child is female	Age of the child	Child is Roma or Turkish	Child does not speak Bulgarian at home	Size of household	Head un-employed	Primary caregiver is home-maker	Income in the first quintile	Income in the second quintile	Income in the third quintile	Income in the fourth quintile	Income in the fifth quintile
Information only	0.040 (0.033)	-0.025 (0.077)	-0.058 (0.077)	-0.073 (0.098)	0.359** (0.164)	0.113* (0.064)	-0.070 (0.062)	0.031 (0.044)	0.044 (0.041)	-0.008 (0.030)	0.001 (0.031)	-0.067 (0.048)
Free access only	0.041 (0.028)	0.026 (0.078)	-0.022 (0.066)	-0.011 (0.090)	0.123 (0.158)	-0.044 (0.064)	0.003 (0.062)	0.029 (0.051)	0.006 (0.036)	-0.001 (0.034)	-0.040 (0.029)	0.005 (0.051)
Free + Information	0.004 (0.029)	-0.090 (0.072)	0.030 (0.061)	-0.009 (0.092)	0.208 (0.145)	0.066 (0.067)	0.001 (0.064)	0.066 (0.051)	0.026 (0.037)	-0.013 (0.031)	-0.019 (0.029)	-0.061 (0.041)
Free + 7 Lev incentive	0.005 (0.027)	0.026 (0.073)	0.021 (0.052)	0.059 (0.085)	0.218 (0.165)	-0.022 (0.062)	0.129* (0.069)	0.061 (0.048)	0.013 (0.033)	0.006 (0.034)	-0.015 (0.029)	-0.065 (0.047)
Free + 7 Lev incentive + Information	0.028 (0.027)	-0.011 (0.070)	0.011 (0.062)	-0.114 (0.093)	0.196 (0.169)	0.002 (0.070)	0.019 (0.061)	0.052 (0.049)	-0.010 (0.037)	-0.044 (0.032)	-0.002 (0.026)	0.004 (0.045)
Free + 20 Lev incentive	0.043 (0.032)	-0.048 (0.069)	0.055 (0.054)	0.024 (0.086)	0.066 (0.166)	0.059 (0.068)	-0.035 (0.069)	0.100* (0.052)	0.003 (0.034)	-0.043 (0.030)	-0.021 (0.027)	-0.039 (0.048)
Free + 20 Lev incentive + Information	0.044 (0.032)	0.018 (0.076)	0.048 (0.056)	0.038 (0.086)	0.370** (0.161)	0.022 (0.061)	0.081 (0.073)	0.043 (0.045)	0.040 (0.035)	-0.033 (0.030)	-0.018 (0.026)	-0.032 (0.047)
Observations	5,158	5,158	5,134	5,131	5,158	5,158	4,691	5,158	5,158	5,158	5,158	5,158
R-squared	0.001	0.002	0.007	0.012	0.006	0.009	0.015	0.005	0.002	0.002	0.001	0.005
Mean in the control group	0.458	3.891	0.760	0.644	4.460	0.356	0.334	0.156	0.185	0.228	0.201	0.231

Notes: Data from baseline survey. Estimates from an OLS regression. \* Significance at 10% level. \*\* Significance at 5% level. \*\*\* Significance at 1% level. Standard errors clustered at the community level.



Table A3. Family Characteristics and Balance check (continued)

	Toilets in the house	Bath-room in the house	Internet connection in the house	Parent completed primary education	Parent has no problem to write a simple text	Parent cannot write a simple text	Family does no activities with child	Child registered in a pre-school program	Walking distance from a KG: less than 15 minutes	Number of employees in the KG	Number of the groups in the KG	Number of children enrolled in the KG	Segregated KG = at least 4 minority children in 5 in the catchment area
Information only	-0.090 (0.064)	-0.046 (0.073)	-0.067 (0.064)	-0.077 (0.066)	0.003 (0.086)	0.042 (0.040)	0.023 (0.049)	-0.031 (0.067)	0.069 (0.085)	-2.706 (2.679)	-0.742 (0.568)	-24.518 (15.810)	0.167 (0.132)
Free access only	0.034 (0.066)	0.054 (0.070)	-0.012 (0.064)	-0.076 (0.068)	-0.043 (0.089)	0.035 (0.045)	0.012 (0.044)	-0.040 (0.074)	-0.023 (0.095)	3.018 (2.754)	0.753 (0.602)	14.116 (16.095)	0.134 (0.130)
Free + Information	-0.058 (0.064)	-0.039 (0.075)	-0.049 (0.063)	-0.090 (0.063)	-0.015 (0.087)	0.018 (0.039)	-0.003 (0.044)	-0.035 (0.066)	0.048 (0.098)	-0.712 (3.248)	-0.125 (0.746)	-4.151 (20.912)	0.120 (0.131)
Free + 7 Lev incentive	-0.072 (0.060)	0.005 (0.069)	-0.014 (0.061)	-0.049 (0.064)	0.050 (0.086)	0.042 (0.041)	-0.023 (0.036)	-0.050 (0.066)	-0.078 (0.099)	-0.585 (2.780)	-0.291 (0.592)	-5.269 (18.448)	0.013 (0.131)
Free + 7 Lev incentive + Information	0.002 (0.066)	0.021 (0.074)	-0.045 (0.058)	0.028 (0.060)	0.024 (0.084)	0.010 (0.034)	-0.003 (0.039)	-0.032 (0.069)	-0.020 (0.092)	2.429 (2.570)	0.035 (0.584)	7.812 (17.300)	0.140 (0.130)
Free + 20 Lev incentive	-0.078 (0.062)	-0.055 (0.068)	-0.081 (0.059)	-0.070 (0.060)	0.028 (0.082)	0.025 (0.042)	0.025 (0.042)	-0.005 (0.063)	-0.041 (0.101)	-0.067 (2.924)	-0.129 (0.684)	-6.040 (17.910)	0.162 (0.129)
Free + 20 Lev incentive + Information	-0.069 (0.061)	-0.054 (0.072)	-0.049 (0.060)	-0.084 (0.062)	0.029 (0.085)	0.017 (0.039)	-0.010 (0.038)	-0.003 (0.068)	0.052 (0.090)	-1.687 (2.480)	-0.486 (0.556)	-23.451 (14.592)	0.107 (0.131)
Observations	5,129	5,13	5,126	5,158	4,677	4,677	5,158	5,145	3,328	5,086	5,106	5,111	5,158
R-squared	0.009	0.006	0.003	0.007	0.003	0.002	0.002	0.001	0.009	0.025	0.026	0.032	0.014
Mean in the control group	0.316	0.485	0.343	0.619	0.532	0.095	0.109	0.678	0.603	17.661	4.119	108.216	0.421

Notes: Data from baseline survey. Estimates from an OLS regression. \* Significance at 10% level. \*\* Significance at 5% level. \*\*\* Significance at 1% level. Standard errors clustered at the community level.

## Appendix I Table 4: Comparison of households interviewed at endline and those that were not

Table A4. Child Characteristics and Attrition

	Child present at endline
Child is female	-0.014* (0.008)
Age of the child	-0.004 (0.006)
Child is Roma or Turkish	0.042*** (0.015)
Child does not speak Bulgarian at home	-0.027** (0.013)
Size of household	0.007** (0.003)
Head unemployed	-0.030** (0.014)
Primary child caregiver is homemaker	0.010 (0.014)
Income in the second quintile	0.030* (0.015)
Income in the third quintile	0.026 (0.018)
Income in the fourth quintile	0.026 (0.019)
Income in the fifth quintile	0.011 (0.020)
Toilets in the house	0.007 (0.015)
Bathroom in the house	-0.002 (0.014)
Internet connection in the house	-0.021* (0.012)
Parent completed primary education	0.003 (0.012)
Parent has no problem to write a simple text	0.018 (0.015)
Parent cannot write a simple text	0.040** (0.016)
Family does no activities with child	-0.018 (0.019)
Child registered in a preschool program	-0.024* (0.013)
Walking distance from a KG: less than 15 minutes	-0.011 (0.013)
Number of employees in the kindergarten	0.001 (0.003)
Number of the groups in the kindergarten	0.015 (0.013)
Number of children enrolled	-0.000* (0.000)
Segregated kindergarten = at least 4 minority children in 5 in the catchment area	-0.020 (0.014)
Observations	4,896
R-squared	0.017
Mean in the control group	0.926

Notes: Data from baseline survey. Estimates from an OLS regression. \* Significance at 10% level. \*\* Significance at 5% level. \*\*\* Significance at 1% level.

## Appendix II: Intra-community correlations of the endline variables

Endline variable	8 children per cluster		12 children per cluster		18 children per cluster	
	Number of clusters	ICC	Number of clusters	ICC	Number of clusters	ICC
Treatment effectiveness						
Perceived there was a free access offer	223	.71	216	.72	188	.7
Perceived there was any financial help	223	.77	216	.77	188	.76
Perceived there was a large financial help	223	.85	216	.84	188	.83
Attended to some information sessions	233	.59	229	.59	199	.59
Attended to 3 or more information sessions	233	.5	229	.51	199	.53
Parental perceptions on the benefits of KG						
Primary school will be completed	235	.26	227	.24	201	.26
Secondary school will be completed	229	.25	220	.23	193	.25
Child will not be bullied in primary school	230	.29	221	.27	194	.26
Child will be treated with respect by teachers in primary school	230	.27	221	.26	194	.26
KG participation						
Ever attended preschool or kindergarten	236	.25	232	.24	206	.24
Registered according to kindergarten registers	219	.24	216	.25	191	.25
Registered in a kindergarten (self-reported)	236	.21	232	.2	206	.19
Self-reported attendance rate over the past 5 days	206	.2	191	.21	163	.21
% of unannounced visits where child was present	236	.25	232	.26	206	.26
Parental work						
Primary child caregiver is working	229	.16	218	.17	171	.15
Primary child caregiver is homemaker	229	.24	218	.24	171	.25
Monthly Income	236	.2	232	.21	206	.22
Income from employment	236	.22	232	.22	206	.22
Count of paid working individuals in HH	236	.22	232	.22	206	.23
Parental involvement in child educational activities						
Past 3 days child got read books or looked at picture books with family member	236	.31	232	.31	206	.3
Past 3 days child got told story	236	.24	232	.23	206	.23
Past 3 days child sang with family member or got sung to	236	.25	232	.25	206	.26
Past 3 days child played with toys with family member	236	.33	232	.31	206	.3
Past 3 days family member spend time with child naming counting or drawing	236	.32	232	.31	206	.31
% of activities done with child	236	.35	232	.34	206	.34
Child development						
% correct literacy tasks	200	.26	177	.25	143	.24
% correct numeracy tasks	200	.18	177	.17	143	.18
% correct motor tasks	195	.19	171	.17	137	.17
% correct socio-emotional tasks	200	.25	177	.24	143	.23

ICC = intra-cluster correlation for individual measurements. A cluster is a community. P-values for the test ICC=0 are all inferior to 0.001 (not reported).

## Appendix III: Impacts by ethnicity

In this report, we use interviewer-identified ethnicity rather than self-identification. Overall, 74% of the households in our sample are identified as Roma by the interviewers, 13% as Turkish, and 13% as Bulgarian.

Based on self-identification, these proportions are respectively 62%, 16%, and 22%. The differences are due to the fact that some households who self-identified as Bulgarian are identified as either Roma or Turkish by the interviewer. Note that for the vast majority of households (91%), self-assessed and enumerators' assessed ethnicities are consistent.

We present in the table below the characteristics of the households whose ethnicity is not consistent and compare with the households whose ethnicity is consistent. We see that ethnicity-inconsistent households are in fact in between majority and minority households: they look closer to majority households in terms of language and religion, while closer to minority households in terms of education and economic outcomes.

VARIABLES	Mean among households consistently identified as majority*	Mean among households with inconsistent ethnicity**	Mean among households consistently identified as minority***
Head of household unemployed	0,24	0,36	0,41
Number of working persons in the households	1,43	0,94	0,88
Income from employment (monthly, in BGN)	462,45	234,36	185,50
Child speaks Bulgarian at home	0,96	0,76	0,22
Child is registered in a kindergarten at baseline	0,87	0,67	0,61
Parent ever attended a kindergarten	1,00	0,99	0,94
Parent did not complete primary education	0,13	0,39	0,55
Christian	0,88	0,72	0,54
Has a computer at home	0,59	0,43	0,29
Has toilet at home	0,55	0,29	0,22
Has internet connection at home	0,59	0,37	0,25
# obs.	641	472	3971

\*Households self-identified as Bulgarian and identified as Bulgarian by the enumerator

\*\*Households self-identified as Bulgarian and identified as Roma or Turkish by the enumerator

\*\*\*Households self-identified as Roma or Turkish and identified as Roma or Turkish by the enumerator

We favor the measure of ethnicity based of interviewer assessment since it is less prone to social image concerns, and thus more commonly used in the literature on Roma.

**Appendix III Table 1: Impact on Treatment Effectiveness, by ethnicity**

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Perceived there was a free access offer	Perceived there was any financial help	Perceived there was a large financial help	Attended to some information sessions	Attended to 3 or more information sessions
Information only	0.0782 (0.0776)	0.140* (0.0841)	-0.00323 (0.0520)	0.325*** (0.0966)	0.164** (0.0651)
Free access only	0.926*** (0.0910)	0.0398 (0.0824)	0.0383 (0.0555)	0.432*** (0.0948)	0.221*** (0.0598)
Free + Information	0.852*** (0.0750)	-0.0266 (0.0782)	-0.0240 (0.0484)	0.912*** (0.0801)	0.656*** (0.107)
Free + 7 Lev incentive	0.815*** (0.0965)	0.526*** (0.113)	-0.0443 (0.0424)	0.275*** (0.0851)	0.124* (0.0649)
Free + 7 Lev incentive + Information	0.900*** (0.0759)	0.658*** (0.126)	0.0614 (0.0593)	0.726*** (0.106)	0.582*** (0.101)
Free + 20 Lev incentive	0.890*** (0.0650)	0.500*** (0.0960)	0.465*** (0.0929)	0.474*** (0.0915)	0.291*** (0.0697)
Free + 20 Lev incentive + Information	0.838*** (0.0901)	0.673*** (0.105)	0.728*** (0.0856)	0.838*** (0.0865)	0.667*** (0.0844)
Roma or Turkish based on interviewer assessment	0.149*** (0.0504)	0.0815* (0.0466)	-0.00193 (0.0268)	0.215*** (0.0548)	0.140*** (0.0392)
Information only and Roma or Turkish	-0.112 (0.0716)	-0.133* (0.0740)	0.00944 (0.0443)	-0.0553 (0.0922)	-0.0558 (0.0486)
Free only and Roma or Turkish	-0.253*** (0.0828)	-0.111 (0.0742)	-0.0321 (0.0487)	-0.275*** (0.0908)	-0.154*** (0.0498)
Free + information and Roma or Turkish	-0.167** (0.0708)	-0.000127 (0.0664)	0.0222 (0.0387)	-0.320*** (0.0803)	-0.210** (0.102)
Free + 7 Lev and Roma or Turkish	-0.183** (0.0834)	-0.132 (0.0952)	0.0238 (0.0371)	-0.0427 (0.0825)	-0.0130 (0.0551)
Free + 7 Lev + information and Roma or Turkish	-0.181** (0.0881)	-0.191 (0.133)	-0.0431 (0.0544)	-0.244** (0.105)	-0.199** (0.0922)
Free + 20 Lev and Roma or Turkish	-0.205*** (0.0627)	-0.0171 (0.0801)	0.0617 (0.0760)	-0.274*** (0.0894)	-0.195*** (0.0658)
Free + 20 Lev + information and Roma or Turkish	-0.120 (0.0736)	-0.138 (0.0919)	-0.118 (0.0756)	-0.274*** (0.0748)	-0.271*** (0.0761)
Observations	5,005	5,005	5,005	5,026	5,026
Strata fixed effects	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Mean of control majority households	0.0404	0.0404	0	0.0101	0.0101
Mean of control minority households	0.104	0.104	0.00351	0.0647	0.00175

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.



**Appendix III Table 2: Impact on enrolment and attendance, by ethnicity**

	(1)	(2)	(3)	(4)	(5)
<b>VARIABLES</b>					
	Ever attended preschool or kindergarten	Registered according to kindergarten registers	Registered in a kindergarten (self-reported)	Self-reported attendance rate over the past 5 days	% of unannounced visits where child was present
Information only	0.0600 (0.0425)	0.0367 (0.0696)	0.00890 (0.0561)	-0.134* (0.0757)	-0.112 (0.0774)
Free access only	0.0937* (0.0480)	0.0947 (0.0585)	0.0822 (0.0753)	0.00305 (0.0775)	0.0670 (0.0637)
Free + Information	0.0837** (0.0388)	0.0404 (0.0575)	0.138*** (0.0500)	0.0306 (0.0626)	-0.0234 (0.0816)
Free + 7 Lev incentive	0.0960** (0.0445)	0.104 (0.0782)	0.0883 (0.0642)	-0.0462 (0.0977)	0.0268 (0.0897)
Free + 7 Lev incentive + Information	0.0649** (0.0295)	0.0696* (0.0421)	0.0826** (0.0414)	0.106* (0.0540)	0.0237 (0.0715)
Free + 20 Lev incentive	0.106** (0.0431)	0.0610 (0.0623)	0.154*** (0.0535)	0.00370 (0.0634)	-0.00586 (0.0636)
Free + 20 Lev incentive + Information	0.0554 (0.0520)	-0.00543 (0.0593)	0.0942 (0.0581)	0.0549 (0.0734)	-0.0370 (0.0843)
Roma or Turkish based on interviewer assessment	0.0253 (0.0416)	-0.0869 (0.0568)	0.00897 (0.0533)	-0.0574 (0.0524)	-0.0948** (0.0458)
Information only and Roma or Turkish	-0.0209 (0.0582)	0.0791 (0.0798)	0.0677 (0.0741)	0.149* (0.0803)	0.150** (0.0748)
Free only and Roma or Turkish	-0.0232 (0.0625)	0.0432 (0.0742)	0.0569 (0.0884)	0.103 (0.0832)	0.0514 (0.0697)
Free + information and Roma or Turkish	0.00738 (0.0543)	0.101 (0.0689)	-0.00661 (0.0673)	0.0142 (0.0655)	0.106 (0.0809)
Free + 7 Lev and Roma or Turkish	-0.0170 (0.0541)	0.0978 (0.0839)	0.0268 (0.0733)	0.0726 (0.0830)	0.0488 (0.0768)
Free + 7 Lev + information and Roma or Turkish	-0.0289 (0.0498)	0.0490 (0.0588)	-0.0130 (0.0606)	-0.0372 (0.0650)	0.0670 (0.0749)
Free + 20 Lev and Roma or Turkish	0.0244 (0.0604)	0.109 (0.0726)	0.00150 (0.0675)	0.103 (0.0683)	0.131** (0.0628)
Free + 20 Lev + information and Roma or Turkish	0.000825 (0.0573)	0.0935 (0.0719)	-0.00535 (0.0674)	-0.0337 (0.0730)	0.0996 (0.0831)
Observations	5,044	4,823	5,044	4,925	5,044
Strata fixed effects	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Mean of control majority households	0.939	0.914	0.889	0.802	0.670
Mean of control minority households	0.792	0.679	0.712	0.588	0.440

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.

**Appendix III Table 3: Impact on Parental Perception of the Benefits of Kindergarten, by ethnicity**

VARIABLES	(1)	(2)	(3)	(4)
	Gap in belief that [...] if child goes to KG versus does not go to KG			
	Primary school will be completed	Secondary school will be completed	Child will not be bullied in primary school	Child will be treated with respect by teachers in primary school
Information only	0.0859 (0.126)	0.0653 (0.108)	0.0812 (0.113)	0.0828 (0.119)
Free access only	-0.0831 (0.115)	-0.00143 (0.115)	-0.0326 (0.0945)	-0.0154 (0.106)
Free + Information	-0.204* (0.105)	-0.0946 (0.118)	0.00191 (0.105)	-0.0173 (0.108)
Free + 7 Lev incentive	-0.0161 (0.123)	-0.0958 (0.127)	-0.0894 (0.128)	-0.0934 (0.130)
Free + 7 Lev incentive + Information	-0.116 (0.153)	-0.128 (0.134)	-0.0905 (0.124)	-0.0703 (0.136)
Free + 20 Lev incentive	-0.0493 (0.114)	-0.0133 (0.107)	-0.000863 (0.106)	0.0243 (0.109)
Free + 20 Lev incentive + Information	-0.0757 (0.121)	-0.119 (0.124)	-0.103 (0.110)	-0.0921 (0.117)
Roma or Turkish based on interviewer assessment	-0.106 (0.0783)	-0.0635 (0.0755)	-0.120 (0.0734)	-0.109 (0.0730)
Information only and Roma or Turkish	0.0682 (0.117)	0.0208 (0.1000)	0.0328 (0.102)	0.0269 (0.109)
Free only and Roma or Turkish	0.154 (0.114)	0.0380 (0.111)	0.107 (0.101)	0.0826 (0.111)
Free + information and Roma or Turkish	0.268*** (0.0984)	0.128 (0.111)	0.0678 (0.0968)	0.0800 (0.0986)
Free + 7 Lev and Roma or Turkish	0.120 (0.118)	0.151 (0.117)	0.107 (0.119)	0.144 (0.117)
Free + 7 Lev + information and Roma or Turkish	0.0945 (0.146)	0.0874 (0.133)	0.0803 (0.122)	0.0620 (0.132)
Free + 20 Lev and Roma or Turkish	0.0973 (0.108)	-0.00971 (0.100)	0.00397 (0.0977)	0.00768 (0.0994)
Free + 20 Lev + information and Roma or Turkish	0.228* (0.119)	0.243** (0.121)	0.264** (0.107)	0.244** (0.114)
Observations	5,037	5,015	5,016	5,015
Strata fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Mean of control majority households	0.475	0.535	0.515	0.515
Mean of control minority households	0.472	0.545	0.475	0.482

Robust standard errors in parentheses \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.

**Appendix III Table 4a Impact on Parental Aspirations for Their Boy, by ethnicity**

	(1)	(2)	(3)	(4)	(5)
<b>VARIABLES</b>	Appropriate age to stop education for a male	Appropriate age to get married for a male	Appropriate age to have children for a male	Secondary or more is considered minimum education for boys	Index of expectations for age appropriateness for boys
Information only	-1.258 (1.019)	-1.024 (1.168)	-1.316 (1.354)	-0.0255 (0.0493)	-0.382 (0.300)
Free access only	-0.650 (0.581)	0.116 (0.686)	-0.421 (0.685)	0.0490 (0.0519)	-0.122 (0.157)
Free + Information	-1.236* (0.653)	0.283 (0.724)	0.191 (0.686)	0.0369 (0.0586)	-0.0982 (0.164)
Free + 7 Lev incentive	-0.594 (0.804)	-0.381 (0.775)	0.128 (0.774)	-0.0569 (0.0636)	-0.147 (0.193)
Free + 7 Lev incentive + Information	-0.121 (1.035)	-0.415 (0.900)	-0.865 (0.839)	-0.00245 (0.0613)	-0.208 (0.214)
Free + 20 Lev incentive	-1.422** (0.704)	-1.005 (0.676)	-1.462** (0.640)	-0.0763 (0.0501)	-0.362** (0.157)
Free + 20 Lev incentive + Information	-1.500* (0.781)	-0.546 (1.028)	-0.939 (1.109)	-0.0392 (0.0553)	-0.285 (0.233)
Roma or Turkish based on interviewer assessment	-1.961*** (0.437)	-1.478*** (0.511)	-1.730*** (0.487)	-0.0322 (0.0443)	-0.445*** (0.123)
Information only and Roma or Turkish	1.860* (0.984)	1.429 (1.083)	1.687 (1.256)	0.107* (0.0569)	0.475* (0.287)
Free only and Roma or Turkish	0.705 (0.545)	0.407 (0.659)	0.871 (0.657)	-0.0316 (0.0603)	0.187 (0.152)
Free + information and Roma or Turkish	1.634** (0.648)	0.416 (0.724)	0.471 (0.707)	-0.0221 (0.0667)	0.249 (0.173)
Free + 7 Lev and Roma or Turkish	0.701 (0.813)	1.083 (0.762)	0.833 (0.764)	0.0715 (0.0594)	0.287 (0.197)
Free + 7 Lev + information and Roma or Turkish	0.406 (1.001)	1.082 (0.900)	1.496* (0.849)	0.0529 (0.0663)	0.312 (0.212)
Free + 20 Lev and Roma or Turkish	1.214 (0.741)	1.025 (0.671)	1.584** (0.655)	0.0534 (0.0548)	0.327** (0.163)
Free + 20 Lev + information and Roma or Turkish	1.714** (0.742)	1.419 (0.981)	2.005* (1.041)	0.101 (0.0654)	0.451** (0.224)
Observations	4,241	4,534	4,505	5,044	4,145
Strata fixed effects	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Mean of control majority households	23.47	25.07	26.81	0.939	0.884
Mean of control minority households	19.59	21.51	22.73	0.763	-0.134

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.

**Appendix III Table 4b: Impact on Parental Aspirations for their Girl, by ethnicity**

VARIABLES	(1) Appropriate age to stop education for a female	(2) Appropriate age to get married for a female	(3) Appropriate age to have children for a female	(4) Secondary or more is consid- ered minimum education for girls	(5) Index of expec- tations for age appropriateness for girls
Information only	-1.630 (1.065)	-1.842* (1.027)	-1.695 (1.093)	-0.0432 (0.0633)	-0.474* (0.250)
Free access only	-0.659 (0.678)	-0.418 (0.690)	-0.405 (0.737)	0.0490 (0.0587)	-0.168 (0.167)
Free + Information	-1.048 (0.752)	0.115 (0.722)	0.568 (0.722)	0.00850 (0.0644)	-0.0710 (0.174)
Free + 7 Lev incentive	-0.736 (1.004)	-0.756 (0.821)	0.139 (0.795)	-0.0651 (0.0758)	-0.167 (0.206)
Free + 7 Lev incentive + Information	-0.170 (1.091)	-0.507 (0.813)	-0.436 (0.805)	0.0266 (0.0648)	-0.155 (0.230)
Free + 20 Lev incentive	-1.475* (0.779)	-0.954 (0.688)	-1.128* (0.653)	-0.0937 (0.0599)	-0.331** (0.160)
Free + 20 Lev incentive + Information	-1.723* (0.901)	-0.945 (1.014)	-1.022 (1.153)	-0.00608 (0.0643)	-0.328 (0.233)
Roma or Turkish based on interviewer assessment	-2.448*** (0.503)	-2.168*** (0.522)	-2.031*** (0.508)	-0.0962* (0.0514)	-0.546*** (0.129)
Information only and Roma or Turkish	2.816*** (1.054)	3.029*** (1.021)	2.540** (1.031)	0.184*** (0.0686)	0.725*** (0.248)
Free only and Roma or Turkish	1.011 (0.620)	0.717 (0.655)	0.681 (0.688)	0.0450 (0.0651)	0.222 (0.158)
Free + information and Roma or Turkish	1.900*** (0.715)	0.900 (0.725)	0.300 (0.723)	0.0580 (0.0692)	0.300* (0.173)
Free + 7 Lev and Roma or Turkish	1.298 (1.025)	1.753** (0.839)	1.042 (0.818)	0.141* (0.0764)	0.379* (0.213)
Free + 7 Lev + information and Roma or Turkish	0.948 (1.051)	1.655** (0.808)	1.474* (0.834)	0.116* (0.0691)	0.367 (0.225)
Free + 20 Lev and Roma or Turkish	1.804** (0.789)	1.425** (0.688)	1.375** (0.639)	0.140** (0.0659)	0.409** (0.159)
Free + 20 Lev + information and Roma or Turkish	2.418*** (0.860)	2.306** (0.993)	2.362** (1.101)	0.120 (0.0741)	0.592*** (0.227)
Observations	4,254	4,543	4,501	5,044	4,158
Strata fixed effects	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Mean of control majority households	23.92	25.55	25.95	0.919	1.033
Mean of control minority households	18.88	20.48	21.54	0.654	-0.164

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.

**Appendix III Table 5: Impact on Household Employment, by ethnicity**

	(1)	(2)	(3)	(4)	(5)
<b>VARIABLES</b>	Primary child caregiver is working	Primary child caregiver is homemaker	Monthly Income	Income from employment	Count of paid working individuals in HH
Information only	-0.0391 (0.0779)	0.0362 (0.105)	-4.527 (25.87)	-106.0*** (36.65)	-0.252* (0.148)
Free access only	-0.00212 (0.0778)	-0.0388 (0.0799)	74.08** (31.86)	59.86 (41.39)	0.00288 (0.135)
Free + Information	-0.0288 (0.0931)	-0.0766 (0.0872)	-4.075 (35.49)	-55.53 (41.93)	-0.167 (0.123)
Free + 7 Lev incentive	-0.0717 (0.0865)	0.0128 (0.0903)	36.99 (27.87)	-23.88 (48.73)	-0.281* (0.154)
Free + 7 Lev incentive + Information	-0.0539 (0.0658)	0.00502 (0.0863)	32.68 (26.81)	31.16 (36.37)	0.00469 (0.126)
Free + 20 Lev incentive	0.0303 (0.0937)	0.108 (0.0992)	101.3* (56.03)	69.45 (55.86)	-0.0503 (0.126)
Free + 20 Lev incentive + Information	-0.0604 (0.0786)	-0.0344 (0.0722)	64.50 (45.81)	14.29 (54.87)	0.0334 (0.122)
Roma or Turkish based on interviewer assessment	-0.109** (0.0531)	0.155** (0.0618)	-10.97 (14.31)	-59.02*** (20.88)	-0.0746 (0.0910)
Information only and Roma or Turkish	-0.0123 (0.0794)	-0.133 (0.106)	4.610 (28.94)	59.62 (36.99)	0.0396 (0.158)
Free only and Roma or Turkish	-0.0334 (0.0818)	0.0166 (0.0868)	-44.43 (34.88)	-45.42 (44.24)	-0.0555 (0.147)
Free + information and Roma or Turkish	0.00419 (0.0964)	0.0117 (0.0891)	7.888 (38.64)	36.95 (42.95)	0.121 (0.124)
Free + 7 Lev and Roma or Turkish	0.0759 (0.0897)	-0.0183 (0.0848)	-31.08 (29.70)	14.60 (48.71)	0.202 (0.153)
Free + 7 Lev + information and Roma or Turkish	0.0476 (0.0738)	-0.0364 (0.0840)	-30.26 (28.40)	-46.14 (37.85)	-0.0535 (0.134)
Free + 20 Lev and Roma or Turkish	-0.0425 (0.0951)	-0.152 (0.0946)	-99.02* (59.66)	-88.54 (59.56)	-0.0704 (0.126)
Free + 20 Lev + information and Roma or Turkish	0.00954 (0.0796)	0.00523 (0.0673)	-57.36 (48.91)	-31.26 (60.13)	-0.178 (0.126)
Observations	4,472	4,472	5,044	5,044	5,044
Strata fixed effects	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Mean of control majority households	0.571	0.214	659.9	526.4	1.465
Mean of control minority households	0.279	0.418	481	303.5	0.991

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.



**Appendix III Table 6: Impact on Family Involvement in Child Education, by ethnicity**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Past 3 days child got read books or looked at picture books with family member	Past 3 days child got told story	Past 3 days child sang with family member or got sung to	Past 3 days child played with toys with family member	Past 3 days family member spend time with child naming counting or drawing	% of activities done with child
Information only	-0.183* (0.0953)	-0.0762 (0.0760)	-0.0143 (0.0949)	-0.0268 (0.0891)	-0.130 (0.0820)	-0.0860 (0.0680)
Free access only	-0.148* (0.0821)	-0.141** (0.0626)	-0.0435 (0.0902)	-0.150 (0.0964)	-0.140* (0.0778)	-0.125** (0.0617)
Free + Information	-0.238** (0.0967)	-0.145** (0.0716)	-0.106 (0.0906)	-0.133 (0.102)	-0.140 (0.0886)	-0.152** (0.0640)
Free + 7 Lev incentive	-0.176* (0.105)	0.0146 (0.0758)	0.133 (0.0915)	-0.0554 (0.0956)	-0.125 (0.0905)	-0.0418 (0.0701)
Free + 7 Lev incentive + Information	-0.0244 (0.0822)	0.00596 (0.0613)	0.0148 (0.125)	-0.0295 (0.114)	0.0443 (0.0709)	0.00222 (0.0618)
Free + 20 Lev incentive	-0.196** (0.0940)	-0.0686 (0.0868)	0.117 (0.0921)	-0.0459 (0.0922)	-0.102 (0.0791)	-0.0592 (0.0674)
Free + 20 Lev incentive + Information	-0.0562 (0.0878)	-0.0940 (0.0779)	-0.0302 (0.0962)	-0.0610 (0.0943)	-0.0730 (0.0798)	-0.0629 (0.0670)
Roma or Turkish based on interviewer assessment	-0.185** (0.0746)	-0.00530 (0.0581)	0.156** (0.0714)	0.0415 (0.0699)	-0.0485 (0.0755)	-0.00822 (0.0523)
Information only and Roma or Turkish	0.114 (0.0934)	-0.0431 (0.0810)	-0.165* (0.0938)	-0.0962 (0.0874)	0.0441 (0.0890)	-0.0292 (0.0665)
Free only and Roma or Turkish	-0.0109 (0.0920)	-0.0825 (0.0767)	-0.209** (0.0961)	-0.00356 (0.101)	-0.0297 (0.0944)	-0.0671 (0.0699)
Free + information and Roma or Turkish	0.203* (0.104)	0.0403 (0.0787)	-0.0176 (0.0903)	-0.00687 (0.106)	0.0881 (0.106)	0.0613 (0.0698)
Free + 7 Lev and Roma or Turkish	0.129 (0.105)	-0.121 (0.0802)	-0.254*** (0.0892)	-0.148 (0.0947)	0.0877 (0.0957)	-0.0611 (0.0697)
Free + 7 Lev + information and Roma or Turkish	0.0154 (0.0985)	-0.0745 (0.0735)	-0.146 (0.127)	-0.0858 (0.110)	-0.0964 (0.0868)	-0.0774 (0.0717)
Free + 20 Lev and Roma or Turkish	0.132 (0.0971)	-0.0657 (0.0951)	-0.280*** (0.0914)	-0.151* (0.0853)	-0.0328 (0.0926)	-0.0795 (0.0705)
Free + 20 Lev + information and Roma or Turkish	-0.0223 (0.0948)	-0.00671 (0.0861)	-0.0798 (0.0993)	-0.130 (0.0970)	-0.0326 (0.0912)	-0.0543 (0.0693)
Observations	5,044	5,044	5,044	5,044	5,044	5,044
Strata fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Mean of control majority households	0.818	0.808	0.697	0.737	0.808	0.774
Mean of control minority households	0.480	0.663	0.770	0.764	0.613	0.658

Robust standard errors in parentheses \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.

**Appendix III Table 7: Impact on Child Development, by ethnicity**

VARIABLES	(1) % correct literacy tasks	(2) % correct numeracy tasks	(3) % correct motor tasks	(4) % correct socio- emotional tasks
Information only	0.0365 (0.0556)	-0.0255 (0.0406)	0.000332 (0.0725)	0.0486 (0.0429)
Free access only	0.0389 (0.0439)	-0.0139 (0.0368)	0.0150 (0.0562)	0.0817** (0.0368)
Free + Information	0.102** (0.0474)	0.0259 (0.0356)	0.0417 (0.0635)	0.0734* (0.0405)
Free + 7 Lev incentive	0.0247 (0.0406)	0.0517 (0.0457)	-0.0524 (0.0630)	0.129*** (0.0485)
Free + 7 Lev incentive + Information	0.0496 (0.0381)	0.00379 (0.0335)	0.0336 (0.0508)	0.0878** (0.0367)
Free + 20 Lev incentive	0.0386 (0.0471)	-0.00414 (0.0388)	-0.00853 (0.0625)	0.0723* (0.0413)
Free + 20 Lev incentive + Information	0.00344 (0.0415)	-0.0800** (0.0344)	0.0516 (0.0614)	0.0827** (0.0381)
Roma or Turkish based on interviewer assessment	0.00782 (0.0375)	0.0137 (0.0296)	-0.0292 (0.0528)	0.0842*** (0.0260)
Information only and Roma or Turkish	-0.0266 (0.0574)	-0.0315 (0.0413)	0.00132 (0.0755)	-0.0772* (0.0408)
Free only and Roma or Turkish	-0.0686 (0.0492)	-0.0649 (0.0412)	0.0281 (0.0602)	-0.111*** (0.0365)
Free + information and Roma or Turkish	-0.109** (0.0502)	-0.0673* (0.0373)	-0.0395 (0.0649)	-0.100*** (0.0368)
Free + 7 Lev and Roma or Turkish	-0.0675 (0.0442)	-0.0800* (0.0484)	0.0399 (0.0671)	-0.172*** (0.0439)
Free + 7 Lev + information and Roma or Turkish	-0.0681 (0.0441)	-0.0330 (0.0374)	0.0400 (0.0552)	-0.111*** (0.0379)
Free + 20 Lev and Roma or Turkish	-0.0566 (0.0515)	-0.0171 (0.0372)	0.0242 (0.0641)	-0.0770** (0.0383)
Free + 20 Lev + information and Roma or Turkish	-0.0316 (0.0459)	0.0257 (0.0376)	-0.0132 (0.0617)	-0.117*** (0.0354)
Observations	4,935	4,935	4,911	4,935
Strata fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Mean of control majority households	0.572	0.699	0.601	0.525
Mean of control minority households	0.415	0.572	0.440	0.471

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.

## Appendix IV: Exploring explanations for the specific impact on minority children's development

In order to explore possible driving factors for the child learning outcomes we observed, we looked at impacts by ethnicity and the level of segregation in the kindergarten, as well as the impacts by ethnicity and language spoken at home.

We had no direct measures of **kindergarten quality**, but we test whether treatment impacts are different depending on the level of segregation in the community as an indirect measure for kindergarten quality. Indeed, the negative impacts of offering free access on minority children may come from the fact that the quality of kindergarten attended by minority children is lower than the quality of kindergarten attended by majority children. In this case, we should not see a detrimental impact of offering free access on minority children in non-segregated communities but only in segregated communities. This test is presented in Appendix IV Table 1.

With **first language**, we test whether children who did not speak Bulgarian as a first language may be benefiting less from free access than their native speaking peers, as Bulgarian is the primary language spoken by teachers in all kindergarten. In this context, non-Bulgarian speakers would still be benefiting from preschool, as they would be improving their skills at speaking Bulgarian, but it may take time for the benefit to materialize since it is well known that bilingualism initially slows down child development without persistent impacts later on. If the negative impacts of offering free access are due to the initial slowdown associated with bilingualism, then we should not see any detrimental impact on minority children who speak Bulgarian at home. This test is presented in Appendix IV Table 2.

**Appendix IV Table 1: Impact on Child Development, by ethnicity and level of segregation**

VARIABLES	(1) % correct literacy tasks	(2) % correct numeracy tasks	(3) % correct motor tasks	(4) % correct socio-emotional tasks
Information only	0.00795 (0.0813)	-0.0259 (0.0705)	-0.00169 (0.101)	0.0593 (0.0731)
Free access only	0.0269 (0.0692)	-0.00190 (0.0661)	0.0362 (0.0940)	0.0675 (0.0658)
Free + Information	0.101 (0.0708)	0.0317 (0.0616)	0.0153 (0.0950)	0.0521 (0.0710)
Free + 7 Lev incentive	-0.0206 (0.0641)	0.0439 (0.0665)	-0.0624 (0.0966)	0.128* (0.0702)
Free + 7 Lev incentive + Information	0.0212 (0.0595)	0.00988 (0.0555)	0.00213 (0.0760)	0.0904 (0.0583)
Free + 20 Lev incentive	0.0191 (0.0738)	-0.0241 (0.0622)	0.0716 (0.0993)	0.0270 (0.0694)
Free + 20 Lev incentive + Information	-0.0169 (0.0599)	-0.0672 (0.0544)	0.0460 (0.0861)	0.0858 (0.0624)
Roma or Turkish based on interviewer assessment	0.0163 (0.0391)	0.0111 (0.0303)	-0.0225 (0.0516)	0.0832*** (0.0233)
Segregated kindergarten	-0.0572 (0.0655)	0.00992 (0.0565)	-0.0109 (0.0783)	-0.00224 (0.0595)
Information only and Roma or Turkish	-0.0360 (0.0564)	-0.0294 (0.0402)	-0.0238 (0.0734)	-0.0613 (0.0388)
Free only and Roma or Turkish	-0.0597 (0.0503)	-0.0585 (0.0393)	0.0381 (0.0582)	-0.116*** (0.0348)
Free + information and Roma or Turkish	-0.0954** (0.0477)	-0.0644* (0.0372)	-0.0662 (0.0604)	-0.108*** (0.0312)
Free + 7 Lev and Roma or Turkish	-0.0908* (0.0462)	-0.0784 (0.0511)	0.0273 (0.0657)	-0.162*** (0.0411)
Free + 7 Lev + information and Roma or Turkish	-0.0783 (0.0476)	-0.0335 (0.0358)	0.00159 (0.0583)	-0.109*** (0.0339)
Free + 20 Lev and Roma or Turkish	-0.0744 (0.0526)	-0.0238 (0.0390)	0.0528 (0.0641)	-0.0845** (0.0375)
Free + 20 Lev + information and Roma or Turkish	-0.0263 (0.0464)	0.0359 (0.0370)	-0.0168 (0.0616)	-0.109*** (0.0320)
Information only and segregated KG	0.0454 (0.0812)	-0.00144 (0.0735)	0.0328 (0.0881)	-0.0335 (0.0719)
Free only and segregated KG	0.000239 (0.0779)	-0.0230 (0.0727)	-0.0394 (0.0945)	0.0250 (0.0707)
Free + information and segregated KG	-0.0247 (0.0754)	-0.00952 (0.0673)	0.0725 (0.0903)	0.0368 (0.0703)
Free + 7 Lev and segregated KG	0.0853 (0.0747)	0.00980 (0.0697)	0.0293 (0.0971)	-0.0155 (0.0698)
Free + 7 Lev + information and segregated KG	0.0435 (0.0756)	-0.00595 (0.0627)	0.0817 (0.0844)	-0.00391 (0.0639)

Free + 20 Lev and segregated KG	0.0426 (0.0790)	0.0317 (0.0696)	-0.120 (0.0980)	0.0601 (0.0710)
Free + 20 Lev + information and segregated KG	0.00523 (0.0705)	-0.0333 (0.0602)	0.00866 (0.0818)	-0.0189 (0.0645)
Observations	4,935	4,935	4,911	4,935
Strata fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Mean of control majority households	0.572	0.699	0.601	0.525
Mean of control minority households	0.415	0.572	0.440	0.471

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.



**Appendix IV Table 2: Impact on Child Development, by ethnicity and language spoken at home**

VARIABLES	(1) % correct literacy tasks	(2) % correct numeracy tasks	(3) % correct motor tasks	(4) % correct socio-emotional tasks
Information only	0.0309 (0.0566)	-0.0218 (0.0407)	0.000554 (0.0730)	0.0446 (0.0434)
Free access only	0.0375 (0.0437)	-0.0108 (0.0363)	0.0155 (0.0568)	0.0798** (0.0362)
Free + Information	0.0971** (0.0471)	0.0303 (0.0361)	0.0439 (0.0649)	0.0709* (0.0406)
Free + 7 Lev incentive	0.0254 (0.0403)	0.0616 (0.0453)	-0.0334 (0.0622)	0.135*** (0.0463)
Free + 7 Lev incentive + Information	0.0488 (0.0384)	0.00718 (0.0337)	0.0359 (0.0508)	0.0879** (0.0367)
Free + 20 Lev incentive	0.0407 (0.0480)	7.07e-05 (0.0385)	-0.000427 (0.0637)	0.0781* (0.0418)
Free + 20 Lev incentive + Information	-0.00122 (0.0415)	-0.0764** (0.0340)	0.0523 (0.0617)	0.0827** (0.0385)
Roma or Turkish based on interviewer assessment	-0.000514 (0.0381)	-0.0229 (0.0316)	-0.0703 (0.0496)	0.0723*** (0.0240)
Segregated kindergarten	-0.0609** (0.0308)	-0.00660 (0.0250)	0.0228 (0.0406)	-0.0445* (0.0238)
Information only and Roma or Turkish	-0.0606 (0.0540)	0.00202 (0.0409)	0.00907 (0.0728)	-0.102*** (0.0380)
Free only and Roma or Turkish	-0.0407 (0.0574)	-0.0396 (0.0453)	0.0606 (0.0600)	-0.109*** (0.0405)
Free + information and Roma or Turkish	-0.0998** (0.0503)	-0.0320 (0.0396)	-0.00211 (0.0611)	-0.0778** (0.0344)
Free + 7 Lev and Roma or Turkish	-0.0545 (0.0487)	-0.0222 (0.0496)	0.136* (0.0691)	-0.144*** (0.0442)
Free + 7 Lev + information and Roma or Turkish	-0.0397 (0.0438)	0.0201 (0.0399)	0.0995* (0.0543)	-0.0990*** (0.0367)
Free + 20 Lev and Roma or Turkish	-0.00776 (0.0590)	0.0172 (0.0405)	0.0893 (0.0669)	-0.0258 (0.0410)
Free + 20 Lev + information and Roma or Turkish	-0.0476 (0.0489)	0.0707* (0.0424)	0.0208 (0.0597)	-0.102*** (0.0360)
Information only and segregated KG	0.0619 (0.0474)	-0.0483 (0.0371)	-0.00151 (0.0529)	0.0495 (0.0377)
Free only and segregated KG	-0.0329 (0.0502)	-0.0391 (0.0395)	-0.0446 (0.0544)	0.00235 (0.0366)
Free + information and segregated KG	-0.00645 (0.0449)	-0.0514 (0.0372)	-0.0496 (0.0532)	-0.0268 (0.0376)
Free + 7 Lev and segregated KG	-0.0172 (0.0409)	-0.0890** (0.0357)	-0.149** (0.0593)	-0.0422 (0.0352)
Free + 7 Lev + information and segregated KG	-0.0433 (0.0400)	-0.0819** (0.0319)	-0.0886* (0.0470)	-0.0161 (0.0326)

Free + 20 Lev and segregated KG	-0.0710 (0.0480)	-0.0503 (0.0312)	-0.0974* (0.0571)	-0.0776** (0.0362)
Free + 20 Lev + information and segregated KG	0.0267 (0.0409)	-0.0652* (0.0340)	-0.0477 (0.0480)	-0.0196 (0.0325)
Observations	4,935	4,935	4,911	4,935
Strata fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Mean of control majority households	0.572	0.699	0.601	0.525
Mean of control minority households	0.415	0.572	0.440	0.471

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in KG at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about their child's future educational attainment.

## Appendix IV-1 Summary of the IDELA tool developed by Save the Children

Here is a list of some items included in the IDELA questionnaire. This list is not exhaustive. Contact Save the Children for more information on the content of the questionnaire.

### Emergent Numeracy/Math

Comparison and Measurement – Child compares objects by size and length using picture cards with circles and pencils

Sorting and Classification – Child groups cards by different similarities using picture cards of stars and circles

Shape identification – Child recognizes shapes on a laminated page with pictures of 6 shapes used in this test (4 shapes + 2 distractors)

Number knowledge – Child recognizes numbers from 1-20 using number chart of numbers

One to One Correspondence – Child picks the right number of objects (5, 8, 15) using small items for counting

Simple addition & subtraction – Child adds and subtracts with help of manipulatives using rocks/blocks used for adding, and picture cards with bikes and apples

Problem Solving – Child completes a simple puzzle using 4 or 6 piece jigsaw puzzle (laminated and standardized, cut appropriately). Include a picture of the puzzle for the child to see.

### Emergent Literacy

Expressive vocabulary – Child names different types of animals and foods

Print awareness – Child knows to open book in right way; Difference between text and pictures; Directionality of reading. Materials: Age appropriate book for 3-5 year olds with pictures and simple text

Letter knowledge – Child recognizes letters of the alphabet using a letter grid with 20 letters

First letter sounds (phonemic awareness) – Child identifies words that have similar beginning sounds using word pair list of common words.

Emergent Writing – Child writes his/her name using blank paper, pencil or pen

Listening comprehension – Child answers 5 questions based on a short story read aloud to him/her using a story adapted to the local context

### Motor Development

Copying a Shape – Child copies a triangle using a pencil, paper, and a picture card with a triangle (fine motor)

Drawing – Child draws a person using a pencil and paper (fine motor)

Simple Folding – Child follows a 5 step folding task using a 20 x 20 cm. piece of paper (fine motor)

Hopping – Child hops up to 10 steps (gross motor)

### Social-emotional skills

Friends / Peers – Child names friends he/she plays with (interpersonal relationships)

Emotional awareness – Child can identify sad, angry, happy (understanding individual emotions)

Perspective taking/Empathy – Child can identify how someone else feels using picture card of a girl crying

Conflict Resolution – Child identifies solutions to a social conflict situation

## Appendix V Design and Content of the Information Sessions

Info session	Short description	Length	Time period of implementation	Leading the session	Attendees
<b>1</b>	Data on benefits of early learning, description of the project and logistics of enrolment in kindergarten.	60 minutes	July- beginning of September 2014	NGO representative	Parents from the whole community
<b>2</b>	Teacher's presentation on the setting and daily regime, curriculum and goals.  NGO repeats logistics of enrolment in kindergarten.	50 minutes	September-October 2014	kindergarten teacher and NGO representative	Parents from the whole community
<b>3</b>	Open house. Observation at the kindergarten of a celebration or a lesson open to the parents.	45 minutes	December 2014, March 2015 or May 2015	kindergarten teacher and NGO representative – observing the children perform	Parents from the whole community
<b>4</b>	Teacher's presentation on children's progress.  NGO training on parent-teacher-child effective communication.	70 minutes	February-March 2015	kindergarten teacher and NGO representative	Parents from the whole community
<b>5</b>	Role model: community representative's presentation on importance of kindergarten for success in school and later on in life.	90 minutes	May-June 2015	NGO representative and Roma role-model	Parents from the whole community

## Appendix VI Reasons for program ineffectiveness

### Program implementation, refusals, and absence of awareness

	Control		Free Access		Free access and additional 7 Lev		Free access and additional 20 Lev		Total
	No info %	Info %	No info %	Info %	No info %	Info %	No info %	Info %	%
<b>Participated in at least one information session</b>									
Yes	5.7	24.6	23.7	66.3	27.9	58.8	26.1	69.8	38.0
No	94.3	75.4	76.3	33.7	72.1	41.2	73.9	30.2	62.0
[....] it was not offered by NGO	94.3	0.0	76.3	0.0	72.1	0.0	73.9	0.0	40.4
[....] there was a refusal by kindergarten (whole village)	0.0	23.4	0.0	0.0	0.0	0.0	0.0	0.0	2.6
[....] the sessions were organized but the respondent did not know	0.0	19.5	0.0	19.0	0.0	21.3	0.0	14.2	9.0
[....] the respondent was not interested to join the sessions	0.0	32.4	0.0	14.7	0.0	19.9	0.0	16.0	10.0
<b>Perceived there was a free access offer</b>									
Yes	9.4	11.3	81.8	83.2	77.7	84.9	83.2	86.9	65.5
No	90.6	88.7	18.2	16.8	22.3	15.1	16.8	13.1	34.5
[....] it was not offered by NGO	90.6	88.7	0.0	0.0	0.0	0.0	0.0	0.0	21.6
[....] the support was available but the respondent did not know	0.0	0.0	7.8	11.9	7.4	7.0	7.5	8.2	6.3
[....] the respondent was not interested to accept the free access	0.0	0.0	10.4	4.9	14.9	8.1	9.3	4.9	6.6
<b>Perceived there was any additional financial help offer</b>									
Yes	9.4	7.4	1.7	5.2	47.2	55.5	56.5	65.4	31.3
No	90.6	92.6	98.3	94.8	52.8	44.5	43.5	34.6	68.7
[....] it was not offered by NGO	90.6	92.6	98.3	94.8	0.0	0.0	0.0	0.0	46.7
[....] the support was available but the respondent did not know	0.0	0.0	0.0	0.0	7.4	7.0	7.5	8.2	3.8
[....] the respondent was not interested to accept any financial support	0.0	0.0	0.0	0.0	45.4	37.4	36.0	26.4	18.2

## Appendix VII Main impacts using a different treatment specification

In this section, we present the results from a different statistical model than the one we use in the main text of the paper. This model, described in Equation 3, regresses the outcome  $Y_{ivc}$  for child  $i$  in settlement  $v$  in stratum  $c$  on a set of dummies indicating each component of the experimental treatments: the *FreeAccess*<sub>vc</sub> dummy equals 1 for children who have been assigned to a treatment that includes free access (i.e. T2-T7); the *Any Financial Incentive*<sub>vc</sub> dummy equals 1 for children who have been assigned to a treatment including any incentive, BGN7 or BGN20 (i.e. T4-T7); the *BGN20 incentive*<sub>vc</sub> dummy equals 1 for children who have been assigned to a treatment including the BGN20 incentive (i.e. T6-T7); finally, the *Information Campaign*<sub>vc</sub> dummy equals 1 for children who have been assigned to a treatment including the information campaign (i.e. T1, T3, T5, and T7). The standard errors allow for non-independence in error terms (“clustering”) within a settlement.

**Equation 3:** 
$$Y_{ivc} = \alpha + \beta_1 \text{FreeAccess}_{vc} + \beta_2 \text{Any Financial Incentive}_{vc} + \beta_3 \text{BGN20 incentive}_{vc} + \beta_4 \text{Information Campaign}_{vc} + \beta_5 \text{Baseline}Y_{ivc} + \gamma_c + \epsilon_{ivc}$$

The key coefficients are:

- $\beta_1$  is the estimated difference in outcome for a child in a settlement that was offered *at least* free access *versus* control settlements.
- $\beta_2$  is the estimated difference in outcome for a child in a settlement that was additionally offered a monthly conditional incentive (either BGN7 or BGN20) *versus* a settlement that was offered free access *only*.
- $\beta_3$  is the estimated difference in outcome for a child in a settlement that was additionally offered a BGN 20 monthly conditional incentive *versus* a settlement that was offered free access and a BNG 7 incentive *only*.
- $\beta_4$  is the estimated difference in outcome for a child in a settlement that was *offered* the information campaign *versus* a settlement without information campaign.

Note that, by program design, an eligible child living in a settlement that was offered either the BGN 7 or BGN 20 conditional incentive would also be eligible for free access. Hence, as an example, for a child in a settlement that was offered the BGN 20 conditional incentive, the estimated difference between his/her outcome and that of a child in a control settlement equals  $\beta_1 + \beta_2 + \beta_3$

Also, an eligible child living in a settlement that was offered the information campaign might be in any financial condition –no free access, or free access only, or free access plus a conditional incentive. Hence, as an example, for a child in a settlement that was offered information sessions and the BGN 20 conditional incentive, the estimated difference between his/her outcome and that of a child in a control settlement equals  $\beta_1 + \beta_2 + \beta_3 + \beta_4$ . As another example, for a child in a settlement that was offered the information campaign only, the estimated difference between his/her outcome and that of a child in a control settlement equals  $\beta_4$ .

The results from this specification are presenting in Appendix VII Tables 2-7.



**Appendix VII Table 2: Impact on Kindergarten Participation**

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Ever attended preschool or kindergarten	Registered according to kindergarten registers	Registered in a kindergarten (self-reported)	Self-reported attendance rate over the past 5 days	% of unannounced visits where child was present
Free Access	0.0623*** (0.0239)	0.0781** (0.0301)	0.0973*** (0.0255)	0.0726** (0.0295)	0.0839*** (0.0280)
Additional effect of any cash incentive	-0.0195 (0.0206)	0.0205 (0.0252)	-0.0359 (0.0220)	-0.0210 (0.0321)	-0.0185 (0.0279)
Additional effect of the large cash incentive	0.0297 (0.0184)	-0.0355 (0.0248)	0.0274 (0.0207)	0.0137 (0.0318)	0.00581 (0.0272)
Independent effect of the information campaign	-0.0125 (0.0149)	-0.0190 (0.0192)	-0.00851 (0.0160)	-0.0155 (0.0210)	-0.0188 (0.0193)
Observations	5,158	4,929	5,158	5,035	5,158
Strata fixed effects	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Mean of control group	0.814	0.717	0.738	0.620	0.474

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate value missing was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in kindergarten at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about future educational attainment.

**Appendix VII Table 3: Impact on Parental Perception of the Benefits of Kindergarten**

	(1)	(2)	(3)	(4)
	Gap in belief that [...] if child goes to KG versus does not go to KG			
VARIABLES	Primary school will be completed	Secondary school will be completed	Child will not be bullied in primary school	Child will be treated with respect by teachers in primary school
Free Access	-0.0331 (0.0415)	-0.0176 (0.0363)	0.00545 (0.0373)	0.00185 (0.0375)
Additional effect of any cash incentive	-0.0122 (0.0422)	-0.0324 (0.0399)	-0.0676* (0.0393)	-0.0452 (0.0400)
Additional effect of the large cash incentive	0.0504 (0.0436)	0.0410 (0.0440)	0.0732* (0.0420)	0.0672 (0.0423)
Independent effect of the information campaign	0.0266 (0.0297)	0.0262 (0.0296)	0.0532* (0.0281)	0.0363 (0.0281)
Observations	5,051	5,029	5,030	5,029
Strata fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Mean of control group	0.472	0.544	0.481	0.487

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in kindergarten at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about future educational attainment.

**Appendix VII Table 4a: Impact on Parental Aspirations for their Boy**

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Appropriate age to stop education for a male	Appropriate age to get married for a male	Appropriate age to have children for a male	Secondary or more is considered minimum education for boys	Index of expectations for age appropriateness for boys
Free Access	-0.0577 (0.197)	0.456* (0.259)	0.334 (0.305)	-0.00845 (0.0258)	0.0623 (0.0613)
Additional effect of any cash incentive	-0.0559 (0.213)	-0.0526 (0.265)	0.0993 (0.314)	-0.00319 (0.0288)	-0.0141 (0.0666)
Additional effect of the large cash incentive	-0.204 (0.225)	-0.190 (0.251)	-0.172 (0.299)	-0.00900 (0.0252)	-0.0440 (0.0638)
Independent effect of the information campaign	0.212 (0.153)	0.227 (0.183)	0.137 (0.218)	0.0412** (0.0179)	0.0473 (0.0455)
Observations	4,336	4,634	4,606	5,158	4,238
Strata fixed effects	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Mean of control group	20.13	22.02	23.32	0.789	0.00896

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in kindergarten at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about future educational attainment.

**Appendix VII Table 4b: Impact on Parental Aspirations for their Girl**

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Appropriate age to stop education for a female	Appropriate age to get married for a female	Appropriate age to have children for a female	Secondary or more is considered minimum education for girls	Index of expectations for age appropriateness for girls
Free Access	0.00594 (0.235)	0.0894 (0.271)	0.183 (0.301)	0.0224 (0.0279)	0.0162 (0.0633)
Additional effect of any cash incentive	-0.0178 (0.215)	0.192 (0.250)	0.359 (0.294)	0.0139 (0.0302)	0.0308 (0.0595)
Additional effect of the large cash incentive	-0.154 (0.246)	-0.0580 (0.269)	-0.280 (0.301)	-0.0261 (0.0274)	-0.0276 (0.0649)
Independent effect of the information campaign	0.310* (0.177)	0.480** (0.196)	0.394* (0.215)	0.0521*** (0.0197)	0.0957** (0.0467)
Observations	4,350	4,643	4,602	5,158	4,253
Strata fixed effects	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Mean of control group	19.59	21.20	22.18	0.693	0.00374

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in kindergarten at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about future educational attainment.

**Appendix VII Table 5: Impact on Household Employment**

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Primary child caregiver is working	Primary child caregiver is a homemaker	Monthly Income	Income from employment	Count of paid working individuals in HH
Free Access	0.00808 (0.0256)	-0.00510 (0.0341)	23.53*** (6.901)	34.98*** (11.18)	0.0961** (0.0440)
Additional effect of any cash incentive	0.0130 (0.0226)	0.0348 (0.0363)	-13.86** (6.852)	-11.41 (11.51)	-0.0200 (0.0432)
Additional effect of the large cash incentive	-0.0156 (0.0218)	-0.0137 (0.0362)	8.198 (6.270)	-0.973 (10.69)	-0.0536 (0.0389)
Independent effect of the information campaign	-0.0256 (0.0161)	-0.0315 (0.0241)	-11.55** (4.658)	-26.32*** (7.506)	-0.0331 (0.0310)
Observations	4,578	4,578	5,158	5,158	5,158
Strata fixed effects	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Mean of control group	0.321	0.388	507.4	336.4	1.061

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate value missing was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in kindergarten at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about future educational attainment.

**Appendix VII Table 6: Impact on Family Involvement in Child Education**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Past 3 days child got read books or looked at picture books with family member	Past 3 days child got told story	Past 3 days child sang with family member or got sung to	Past 3 days child played with toys with family member	Past 3 days family member spend time with child naming counting or drawing	% of activities done with child
Free Access	-0.0633* (0.0383)	-0.105*** (0.0335)	-0.0945** (0.0380)	-0.0959*** (0.0359)	-0.0716* (0.0367)	-0.0860*** (0.0311)
Additional effect of any cash incentive	0.0637* (0.0367)	0.0794** (0.0333)	0.0685* (0.0371)	-0.00140 (0.0397)	0.0610* (0.0332)	0.0542* (0.0292)
Additional effect of the large cash incentive	-0.0368 (0.0369)	-0.0314 (0.0343)	-0.0101 (0.0371)	-0.0260 (0.0386)	-0.0641* (0.0348)	-0.0337 (0.0291)
Independent effect of the information campaign	0.0122 (0.0266)	0.0108 (0.0237)	-0.00650 (0.0262)	-0.00273 (0.0256)	0.0103 (0.0249)	0.00481 (0.0211)
Observations	5,158	5,158	5,158	5,158	5,158	5,158
Strata fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Mean of control group	0.530	0.685	0.759	0.760	0.641	0.675

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate value missing was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in kindergarten at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about future educational attainment.

**Appendix VII Table 7: Impact on Child Learning and Development**

	(1)	(2)	(3)	(4)
VARIABLES	% correct literacy tasks	% correct numeracy tasks	% correct motor tasks	% correct socio-emotional tasks
Free Access	-0.0104 (0.0190)	-0.0264 (0.0160)	0.0183 (0.0173)	-0.00493 (0.0157)
Additional effect of any cash incentive	-0.0129 (0.0170)	0.0271* (0.0148)	-0.000173 (0.0187)	-0.00382 (0.0157)
Additional effect of the large cash incentive	0.00260 (0.0171)	-0.0140 (0.0146)	0.00483 (0.0198)	0.0101 (0.0154)
Independent effect of the information campaign	0.0127 (0.0124)	-0.0167 (0.0103)	0.0166 (0.0129)	-0.00916 (0.0108)
Observations	5,044	5,044	5,018	5,044
Strata fixed effects	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Mean of control group	0.438	0.591	0.464	0.479

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Standard errors clustered at the community level. Any covariate missing value was replaced with the community average, and a missing dummy for each variable containing at least one missing value has been included in the model. Controls include age, gender, language, household size, employment of head, income, parental involvement, registered in kindergarten at baseline, education of parents, single parent household, presence of books in house, expectations of parents about kindergarten and about future educational attainment.