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Making Ice Cream in Tehran: A Field Experiment on the Impact of Attendance Incentives for Street Working Children

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UNIVERSITY OF SAN FRANCISCO

MASTER'S THESIS

Making Ice Cream in Tehran
A Field Experiment on the Impact of Attendance
Interventions for Street Working Children

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*A thesis submitted in fulfillment of the requirements
for the degree of Master of Science
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“All things are just one and when you want something all the universe conspires in helping you to achieve it.”

Paulo Coelho

Abstract

A substantial body of literature has focused on educational attainment and children's performance to foster human capital. Despite the common goal, there is a debate on how to best approach it (Duflo et al. 2013). While in some studies incentives are effective in changing people's behavior, by inducing more effort and higher performance, other works point to crowding out of intrinsic motivations and other externalities. This study reports the results of an experiment conducted with children usually working in the streets of Tehran (Iran) on the effectiveness of non-monetary incentives on school attendance and related behaviors. My within-subject design (dictated by severe restrictions in terms of subject pool and harmless of the incentive given how vulnerable the subject pool is) consisting of making ice cream at alternating dates and giving it to all children present that day at the NGO school. The data show significant evidence that the treatment increases the probability of attendance by 13% ($p < 0.01$), especially strong for boys. In addition, without any claim of causality, initial and final survey results indicate an overall improvement of children levels of aspirations and trust after participation in the program. Further captured by drawings, children appear to be less anxious, less timid and more confident by the end of the program.

Key Words: Attendance Incentives, Street Working Children

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To my parents, who taught me how to fly!

Chapter 1

Introduction

The World Bank has stressed educating children as a key to the fight against poverty since 1962. Children in poverty who are left without an education not only miss their own future opportunities, but also deprive society of the potential talents they could contribute, if nurtured. The importance of education, in an economic perspective, goes beyond the income effect and economic growth. Social returns on educational attainment would indeed provide a higher level of development and welfare. Educational attainment seems to be a more efficient tool for child labor eradication than its complete ban via legislation, which could lead economically active children to starve (Cardoso et al. 2004). A great deal of literature has focused on schooling attainment and children's performance. The main purpose of this line of research is to find efficient ways to lower the opportunity cost of schooling for children living in poverty. Despite the common goal, there is a debate on how to best approach it (Dufflo et al. 2013).

Recently, behavioral economists moved their focus toward the use of incentives interventions in educational attainment (Greenzy et al. 2011) . A growing body of literature attempts to test whether "incentives matter" in changing people's behavior. Therefore an important question that might arise here is when incentives work, and do not work. It would be important for policy makers to redirect their funds to more cost-effective approaches in an effort to foster human capital and ultimately alleviate poverty.

Some studies show incentives are effective in inducing more efforts and higher performance, while other studies point to crowding effect, where an extrinsic motivation conflicts with an intrinsic one, and causes an adverse effect. What is really important in this line of research is how the incentives should be structured, and what the appropriate experimental design is. The purpose of this study is to shed light on effectiveness of incentives in changing people's behaviors. The hypothesis I attempt to test in this study is whether a non-monetary incentive enhances school attendance and improves related behaviors of street working children in Iran.

I conducted a randomized experiment in a non-governmental organization (NGO) school in Tehran, which was called the Society of Protecting the Rights of Children in Iran, IRSPRC. Experimental intervention assigned treatment to the entire school and was implemented with the cooperation of principals and administrators in the treated school. This NGO provides a school to Afghan and Iranian children that do not have the opportunity of going to public or private schools. These children, who usually work in the streets to contribute to their family income are called street working children by the NGO's definition. The vulnerability of the subject pool leaves me with limited choices to apply different games or approaches to study their behaviors. Hence, the incentive introduced in this study is ice cream. Ice cream is something all children love. Children would be simply exhilarated if someone made it for them in school for free.

Given the susceptibility of the subject pool, I had to use a within-subject design to evaluate the incentive intervention. Therefore, unlike the existing literature, in this study there is not a conventional control group and it is defined over time during the seven weeks program. Ice cream was given to all present students in the school on Saturday¹, every other week. This is considered as the treatment, for a total of 3 weeks. On the other hand, in the other 4 weeks, students did not receive any ice cream and their attendance was the only thing controlled (i.e. control weeks without receiving the incentive). The findings indicate that receiving the incentive boosts the probability of children attending school by 13 percentage points, statistically significant at 1%. Consistent with the existing literature, this study shows that the treatment effect varies across subgroups in which boys appear to be more responsive to the treatment than girls. In addition, without making any causal claims, the initial and final survey results not only show improvements in children's aspirations, but also heterogeneous changes in the level of their trust. Their psychological well-being, captured by their drawings, indicate they get less anxious and shy, but more confident post-ante. However, these improvements might be due to a correlation between participation in the program and children's social preferences/psychological well-being, but it cannot be referred to as a direct outcome of the incentive itself. This would be a potential area for future research.

This paper would add to this line of research by providing a new source of data on attendance incentives from a developing country. It shows strong evidence that incentives might be effective even without being a very complicated objective. However, future research is needed to test the external validity of my study. The paper proceeds as follows: Section 2 is a brief review of the existing literature. Section 3 provides a detailed description of children's background, and describes

¹The intervention is limited to make ice cream only on Saturday of a treatment week due to Ramadan. The NGO prefers to act a little conservative because of the neighborhood. The school was located in a poor neighborhood, and most of neighbors were religious people

the experimental design. Section 4 explains the evaluation strategy. The results are presented in Section 5. Section 6 checks the robustness of experimental results. Finally, Section 7 concludes.

Chapter 2

Literature Review

2.1 Education

Because of the Millennium Development Goals¹, a substantial body of literature has focused on schooling attainment and children’s performance to foster human capital. The main purpose of this line of research is to find efficient ways to lower the opportunity cost of going to school for children living in poverty, so to increase schooling. Despite the common goal, there is a debate on how to best approach it (Duflo et al. 2013). Early literature focused more on non-experimental evaluations of schooling and children’s learning process. However, methodological problems involved with observational data in this area such as measurement errors, sample selection bias, and endogeneity lead economists to rely more on randomized evaluations (Glewwe 2002).

Behavioral economics has been progressively attempting to explain many unanswered questions in nearly every field in economics. Levitt et al. (2013, page 2) postulate that “. *Theorists are recognizing behavioral regularities that lie outside of the standard paradigm in their models, empiricists are taking new behavioral predictions to the lab and field, and policymakers are increasingly recognizing the power of psychology when crafting new legislation. One area where behavioral economics has made only limited inroads, however, is in education circles. This is puzzling since it is an area where the insights gained from behavioral economics might be especially great*”

In the matter of efficiency, the existing literature recently moved their focus toward the use of incentives in behavioral interventions for school attendance and school performance (Greenzy et al. 2011). This line of research attempts to test whether “incentives matter” in changing people’s behaviors.

¹MDG, all children in school by 2015

2.2 Educational Incentives

Incentive is “a thing that motivates or encourages one to do something”, by the definition of a dictionary. Economists may consider incentives as a “positive reinforcement” that encourage efforts and performance, while psychologists and sociologists consider them as “negative reinforcement” that undermine the “intrinsic motivation” (Benabou & Trole, 2003). There is an argument in the literature whether an extrinsic incentive encourages people to improve their behaviors or it crowds out people’s intrinsic motivations and causes to be counterproductive. There is also another open question in the literature which debates on the long-run effect of extrinsic motivations (i.e. referred to as the time incentives are removed), which I will explain in detail later in this section.

Why do incentives work well in some contexts, but appear counterproductive in others? Benabou and Trole (2003) indicate how an extrinsic motivation may crowd out an intrinsic motivation. They argue that a principal (teacher, parent or manager) can adversely affect an agent’s (worker, child) behaviors through an information channel. Extrinsic incentives might give a signal, “bad news”, to the agent that the principal does not trust their ability to do a task. Or, also it might signal to the agent that the task is not attractive enough itself and requires an external stimulation. In other words, the extrinsic incentive would crowd out the intrinsic one if the stakes are not high enough to let the price effect exceed the crowding effect and “hidden cost”, suggested by psychologists. This might explain Berry’s (2013) findings in studying the impacts of monetary incentives on students’ test scores that show pupils at secondary level are more responsive to high value financial incentives, but not low value. Benabou and Trole (2003) consider two sources for the hidden cost: first, the agent’s distraction from the process of doing the task to just receive the reward; second, the extrinsic incentive might affect the agent’s time preferences that may value the future less in the short-run. They suggest that to avoid the unfavorable effect of incentives there should be an asymmetric information between agents and principals more in favor of principals. I personally believe economists, unlike psychologists, may not deceive the subjects in an experiment to induce their interested results. This is not only important to know when things work, it is also essential to understand why they work, in a policy perspective. I would relate this to more favoring unconditional interventions that might lower the possibility of “bad news” so as not to have a detrimental effect on intrinsic motivations. Educational incentives are usually classified in two categories: 1. School attendance and enrollment’s rewards; 2. Achievement and performance incentives. Attendance incentives do not involve complicated objectives. This makes it easier for students to achieve them as well as for researchers to measure them in which students either attend school, and receive their incentive or do not. Another advantage of attendance incentives is that they

may control the crowding effect by assigning the incentive indirectly to students. A large body of literature has studied the effect of attendance incentives by providing cash transfers to students' families given the condition of their children's schooling. Most of the studies in this category (i.e. school attendance and enrollment) have shown incentives appear to be effective. Unlike the enrollment incentives, the evidence on performance interventions are mixed and depend on the characteristics of the treatment. They might have an adverse effect if the stake is not high enough to exceed the crowding effect. However, they appear to work better in improvement of measurable subjects such as math rather than conceptual courses (Benabou and Trole 2003).

Yet, depending on whether the problem is school absenteeism, or poor performance in school, or a combination of both, the structure of incentives and experimental design would be different. Due to poverty, children might be out of school or perform poorly, even with a high level of intelligence. There are also some other factors such as health issues (like worming in Africa), school characteristics (like teacher's qualification), teacher absenteeism, access to school, and developmental traps, which might cause these problems. A large body of literature has studied schooling incentives by taking these factors into account to enhance school attendance, and improve performance with the purpose of finding cost-effective solutions. Kremer et al. (2000), in their randomized experiment, provide textbooks for 25 random schools in Kenya in order to study its impact on children's test scores. Their findings indicate a higher rate of completion in primary school, and greater enrollment in secondary level, but no effect on children's test scores. However, the effect was only limited to those treated children that were already in the two highest quintile of initial academic achievements. Miguel et al. (2004) find a 30% increase in schooling of Kenyan children by assigning free breakfast meals as an incentive. However, the positive impact of the program on children's outcome was only limited to students with educated teachers. Furthermore, Heckman et al (2006) focus on the importance of noncognitive traits as a crucial factor in explaining the reason of systematic school dropout or absenteeism even with having the opportunity of free schooling. Heckman et al. (2007) hypothesize that targeting non-cognitive skills (i.e. personal characteristics such as self-efficacy, self-esteem, and grit) not only improves children's cognition but also educational attainment and outcomes later in life. Therefore they argue that incentives that target non-cognitive skills in early childhood might be more cost effective in changing people's behavior of schooling. Similarly, Schunk (1985) shows that psychological procedures can improve children's performance in school by creating and enhancing a sense of self efficacy in them.

An interesting point in the literature is that educational incentives appear to have the possibility of heterogeneous effect across treated subjects with respect to

gender. Berry (2013), and Levitt et al. (2012) indicate younger boys are more responsive to non-monetary incentives. Barrera et al. (2008) also show that boys even respond strongly to monetary rewards in their attendance, compared to their female peers. This is important in terms of policy perspective to understand gender differences in the effectiveness of interventions. This area in the literature requires an interdisciplinary effort to realize why gender seems to play an important role in educational incentives. In sociological perspective, there are some important determinants such as institutional factors or family background that might derive different responses to educational incentives among girls and boys. In the sociology literature, Buchmann et al. (2007) as an example, refer to socio-cultural changes in gender role, mothers educations in a household, individual characteristics (especially aspirations), and prior academic performance as important determinants of inequalities in educational attainment. Burde et al. (2003) study the relationship between access to schools and enrollment in Afghanistan. Their results indicate that girls are more responsive to both attendance and performance incentives when the access to school is facilitated. They explain their findings by pointing to the Afghan's conservative cultural norms that girls, unlike boys, are not allowed to commute alone. Therefore, when the access to school was facilitated they were able to attend school more and showed higher grades. This suggest that gender differences in educational incentives do not only depend on children's intrinsic motivations, but also on the environmental factors and cultural norms.

In all these studies, mentioned above, the effectiveness of educational incentives substantially depend on how they are designed, whom the recipients are, how they should be structured, and in which form they should (Buchmann, DiPrete, & McDaniel, 2007) receive either monetary or non-monetary. More importantly, it also depends on how extrinsic motivations would interact with intrinsic, and social motivations (Greenzy et al. 2011). Incentives are well structured in an appropriate experimental design if one takes all these factors into account. It seems incentives do matter, but they work differently in different settings. Therefore, I would dedicate a subsection to each of these factors to explain them in details. Their orders would be as it follows: Section 2.2.1 considers the importance of the recipient of the incentives. Section 2.2.2 explains which form of incentives might be more effective. Section 2.2.3 discusses the appropriate time to give incentives.

2.2.1 The Recipient of Incentives

The existing literature show that variation in design or structure of a program matter in effectiveness of the incentives. One of the important determinants is the recipient of the incentive or the level of treatment assignment. A researcher's decision whether to give the incentive directly or indirectly to study's subject-pool that might affect the results significantly.

There is not a consensus among economists on this issue. Some economists point to the possibility of the crowding effect suggesting that assigning incentives to parents or teachers would work better. As mentioned earlier, giving incentives directly to students might signal the “bad news” to students in the process of performing the task and undermine one’s self-esteem and create dependence (Benabou et al 2003) . Likewise, some highlight the importance of poverty as the primary reason for children to be out of school and working to contribute to family income. Therefore, providing financial incentives to parents living in poverty, given the condition of sending their children to school might reduce the opportunity cost of schooling for their children. Amin et al. (2000) explain how this type of intervention minimizes the direct cost of schooling by relaxing households’ financial constraints as well as compensating households for their children’s forgone labor (i.e. reducing the indirect costs of schooling). There has been a large body of literature focused on the effectiveness of Progressa in rural Mexico and similar related studies to evaluate the effect of cash transfers with a condition of schooling. Skoufias et al. (2001), for example, on studying the impact of Progressa, indicate that it has a significant impact on health and welfare in rural households in Mexico. Greenzy et al. (2011) argue that the first years of Progressa show higher school attendance, less grade repetition, and better performance in schools for treated children as well as their younger siblings, who were not directly exposed to receiving the treatment through the program (positive externalities).

However, there is a notable caveat in this type of intervention that has been argued by some other economists. Incentivizing parents financially may change their time-allocation of labor in response to schooling decisions. This means parents may send their targeted children to school, and replace their forgone income by sending the siblings to work. In other words, it can affect the educational decisions of in-charge recipients in utilizing the incentives within a household that might bias the results. Studies show that parents as the recipients of monetary incentives, given the condition of their children’s schooling, might redirect their educational investment more in favor of the treated children. This might enhance inequalities in educational decisions within a household. Hence, indirect incentives might lead to both negative and positive spillovers. Barrera et al. (2008) observe some negative spillovers in studying the effect of conditional cash transfers within households. It appears their treatment increases the school attendance of treated children although the untreated siblings seem to attend school less in order to work. Cardoso et al (2004) conduct an experiment in Brazil to study the impact of conditional cash transfers on schooling (CCT). Their findings show that the intervention might increase the school attendance but not decrease the child labor. They explain that the CCT seems to be not large enough to fully ignore the payoff of their children working as a laborer. In other words, in their experiment, children

allocate their time between schooling and working by reducing their leisure time. As Gustafsson-Wright et al (2002), in their empirical study about street children in Brazil, suggest that schooling and being a child laborer are not “*mutually exclusive*”. Therefore indirect incentives might solve the crowding effect issue, but it increases the risk of funds reallocation, if monetary incentives are in place.

Alternatively, economists also study impacts of direct incentives for learning to address this issue. Berry (2013) evaluates the effect of different incentives (cash and non-cash) on children’s performance by giving them to different recipients (parents or children), in India. He shows that children’s grades reflect the productivity of their parents. He suggests that incentives work differently on children’s outcome if the incentivized recipient is a parent or a child. His findings indicate that giving incentives directly to children whose parents are less productive, defined as monitoring and inspiring their children, are more effective. On the other hand, when parents are productive it is more effective to reward them (indirect incentives) to make a progress in their children’s learning process.

Furthermore, some economists have called attention to learning environments outside of a household. As well, school quality or teachers’ qualifications appear to matter in improving children’s learning or their willingness to attend school. Glewwe (2002), and Vermeersch et al (2004) , discuss that a higher school quality, including school characteristics, and teachers’ qualifications and performance, seem to be important in enhancing children’s cognitive skills. Therefore, an indirect incentive might be better to be assigned to teachers to induce more educational attainment. Duflo et al (2005) study the impact of targeting teacher absenteeism on children’s test scores in the context of a randomized evaluation in India. Teachers were incentivized financially, given the condition of spending more hours in school. They were supposed to take a picture with children in the beginning and at the end of the class to prove their presence. Their findings indicate improvement in children’s test scores that lasts in the long-run even after the incentive was removed. However, their findings do not provide a statistical difference in school attendance between treated and untreated children.

2.2.2 The Value of Incentives

Another important factor in effectiveness of incentives is the form in which they are assigned. There are two forms of incentives: one is non-monetary form, and the other is a pecuniary incentive. Their value and applications might be different from case to case. However, there is not a consensus on which weighs more than the other.

Monetary incentives have their own complications. They have two types of effects: 1. direct price effect, and 2. indirect psychological effect; the latter can crowd out the former’s effect (Greenzy et al. 2011). Therefore, financial incentives

play as a double-edged sword. If they are not large enough to exceed the crowding effect, they might have an adverse effect on subjects' pool. On the other hand, if they are too large, they may let the self-interest preferences exceed the social preferences. The best example is the known study of rewarding the blood donors and its detrimental effect on donors, introduced by Richard Titmuss. Therefore, for a financial-incentive to have a positive effect, a researcher should "*pay enough or do not pay at all*" (Greenzy et al. 2011). In addition, Benabou et al. (2003) argue that one can prevent the crowding effect if incentives are well structured to protect the recipient's self-esteem and do not undermine it. Furthermore, theoretically, the financial incentives are also criticized due to the possibility that their effect might fade out after being removed. However, empirical studies show that when the motivations are already low, financial rewards are less likely to have a long-term detrimental effects on it. As Levitt et al (2012) argue there is no difference between the effect of removing financial and non-financial incentives on children's subsequent behaviors. However, rewards with lower values can crowd out the inherent motivation.

In contrast, non-monetary incentives are considerably cost-effective, as opposed to pecuniary ones. However, in some cases it may be hard to find a non-financial incentive with a high enough value to positively change people's behaviors. That could be one of the reasons why studies utilize non-monetary incentives in early childhood interventions.

2.2.3 The Time of Giving Incentives

Another important question, in terms of policy perspective, refers to the time to give the incentives. Time does matter in changing the result, and so does the value of the incentives. There are two aspects that can be discussed on importance of the time. First, it is essential to know what age is an effective time to assign the incentives. Is an early intervention preferable or a later one? Time of investment matters depending on what a policy wants to achieve. If the goal is to enhance educational attainment, investment at younger ages would be preferable to later investment. However, if the goal is to reduce crimes, the efficient approach is later investment (Heckman et al. 2010) . Berry (2013) shows that younger children, at primary level are more responsive to non-monetary incentives, while students at secondary level respond better to high value financial incentives, but not low (List et al. (2012). Therefore, to foster human capital accumulation, it appears to be more efficient to change people's preferences in their childhood. Heckman et al. (2007) hypothesize that early childhood is the most cost-effective time to target children's psychological factors in order to change people's preferences. This early investment might lead to the development of adult's cognition and the improvement of their performance in schools or in the job market. Second, it is important

to consider an appropriate time for implementing the intervention in an experimental design in order to get an unbiased average treatment effect. Levitt et al. (2012) explore the effect of different incentive interventions (financial and non-financial) on school performance at different time horizons, immediately and in a delayed time period (one to two months later), among students of different ages. They find that delayed rewards have no significant effect on children's learning. This makes it hard for policy makers to deal with, since it may result in under-investment in human capital and reduce the efforts students will make. Kremer et al (2004), in evaluation of breakfast meals on children's schooling, find a slight impact on their test scores. They explain this insignificant effect by a problem in enforcing the incentive that was not given at the time it was designed for (i.e. at the beginning of the class). Barrera et al. (2008), given the condition of school attendance and enrollment, also show that the time of incentives matters when the cash transfers are provided to parents monthly, as opposed to a large lump-sum at the time of re-enrollment decision. Their findings suggest that the lump-sum cash transfers increase the enrollment in both secondary and tertiary institutions without affecting students' daily attendance.

An important unanswered question in this literature is the long-term effect of educational incentives. In the literature, the long-run is defined as the time incentives are removed. Results on the long-run effect of incentives are still scarce and complicated, which is not in favor of policy makers. Some studies find a long lasting effect such as Duflo et al. (2005), but some like Edmond et al. (2013) show that the effect of their conditional monetary incentives, in forms of scholarships and stipend, faded out as soon as the incentive was removed. Their findings indicate that even for children that usually working in very difficult jobs, supply of schooling responds only to the incentives. This area requires further research to study what would happen after the incentives are removed.

Greenzy et al. (2011) argue that this line of research is still quite recent and may lack good data. Similarly, List et al. (2012) discuss that educational investment always come with a delay, as a result it may lead policy makers to under-invest in educational interventions. Sometimes the adverse effect may remain after removing the incentive through the channel of information. This might weaken the importance of assigning the incentive at the beginning. Benabou et al. (2003, page 156) state “. *In particular, they have called attention to the fact that explicit incentive schemes may sometimes backfire, especially in the long run, by undermining agents' confidence in their own abilities or in the value of the rewarded task. This side of social psychology has been largely neglected by economists*” In other words, they suggest that in order to have effective incentives, one should take the psychological effect of incentives into account.

This study reports the results of an experiment conducted with children usu-

ally working in the streets of Tehran (Iran) on the effectiveness of non-monetary incentives on school attendance and related behaviors. In this study, I had to consider non-financial incentives, due to the ethical issues, and I provided the incentive, ice cream, directly to them. I attempted to add to the literature that “incentives matter” in changing children’s attendance even with not a very high value objective. However, I think this study will also contribute to this line of research by confirming the possibility that gender differences matter in responding to this type of intervention.

Chapter 3

Experimental Design

3.1 Background

The Society of Protecting the Rights of Children in Iran (IRSPRC) is a non-governmental organization (NGO) that pursues similar goals with UNICEF, and fosters their convention on the rights of children. They provide free education for children in poverty (migrants and citizens) with the priority of combating the child labor. According to UNICEF (databases 2012), in Iran, 11.4% of children age 5-14 work to contribute to their families' income so as not to fall below the subsistence level.

This NGO provides street working children a school in Tehran to facilitate transportation from their houses to school, and school to work each day. The school is different from a regular classification. First, students enroll in this school if they are prohibited from going to public or private schools, which I will call formal schools in this paper. Enrolled students are either undocumented Afghan migrants or legal migrants, and Iranian citizens who are too old to sit with their peers. Therefore, similarities in the level of their knowledge is the main determinant of their classification rather than age. Indeed, grade repetition is a common thing among them. Second, the school is not a single-sex school like regular schools in Iran.

These children are street working children by the NGO's definition. This means they live with their families, but depending on their ages and gender, they do different jobs at home or in the streets. The youngest children mostly work as street peddlers. As they get older, they might work in central Tehran's slaughterhouse and do more difficult jobs there. Girls may also do domestic work such as house-keeping, cooking and taking care of younger siblings. It is important to consider the role of domestic chores as child labor in developing countries. If the work is domestic, then girls are more likely to be left out of school than boys (Kruger et

al. 2011).

3.2 Experimental Protocol

This experiment studies the behavior of street working children enrolled in the IRSPRC School, known as House of Nasirkhosrow (HN), in summer 2014. HN provided a summer school with the purpose of preparing students for the upcoming academic year. Classes were held on Saturdays¹, Mondays, and Wednesdays. Two types of students, total of 100, enrolled in summer classes: first, students who have this NGO as their only option of education; second, students from formal schools who seek to do some extracurricular activities at HN.

The question I attempt to answer in this experiment is whether a non-monetary incentive enhances children's school attendance. The vulnerability of street working children leaves me with limited choices to apply different games or approaches to study their behaviors. Hence, I considered an incentive that cannot be taken out of school to provoke their jealousies. The incentive introduced in this study is ice cream. Ice cream is something all children love. Children would be simply exhilarated if someone made it for them in school for free. However, it is a normal good in Iran and can be found in any supermarket at a fair price. What makes this study unique in this line of research is the simplicity of the incentive. It does not involve a complicated objective that students may not know how to achieve. Due to their susceptibility, I had to use a within-subject design to make sure that each child in the school receives the incentive. Therefore, unlike the existing literature, in this study there is not a conventional control group. I define my counter-factual over time during my seven weeks program (i.e. the length of the summer school). Ice cream was given to all student present in the school on Saturday², every other week. This is considered as the treatment, for a total of 3 weeks. On the other hand, in the other 4 weeks, students did not receive any ice cream and their attendance was the only thing controlled (i.e. control weeks, without receiving the incentive). In other words, all students present received the intervention for 3 weeks, but not consecutively. The children were informed about the ice cream-making activity ahead of time. They received the ice cream in one round in their break (between their morning and afternoon classes), and in a second round right after their school ended.

I collected attendance data through a series of school visits (each Saturday, Monday, and Wednesday during the program) in order to avoid the self-reporting

¹School week starts on Saturday and ends on Thursday in Iran.

²The intervention is limited to make ice cream only on Saturday of a treatment week due to Ramadan. The NGO prefers to act a little conservative because of the neighborhood. The school was located in a poor neighborhood, and most of neighbors were religious people.

bias associated with the survey data used in most other studies. I had to eliminate Mondays from my dataset due to teacher absenteeism. Most Mondays, children were sent back home, because their teacher did not show up. In addition, I utilized initial and final surveys to measure the level of their behaviors in cooperation, trust, patience, aspirations and psychological factors before and after the program. This is to assess if the intervention improves their related behaviors, along with their attendance. This process had to be done after school time (for an hour), so as not to take their teaching time. Experimental intervention assigned treatment to entire school and was implemented with the cooperation of principals and administrators in the treated school. The NGO was responsible for coordinating with their parents, and their employers if necessary, to keep students longer in school. The school did not allow me to survey all 100 enrolled student in order to keep the subject-pool small enough to be able to organize and coordinate everything. Therefore, I had to randomly select 35 students out of all 100 enrolled students with the purpose of data analysis. However, six of the students never showed up after the first day of school. Therefore, the sample shrank to 29 students due to attrition. In other words, data was only collected from 29 students, but any student present (out of 100) received the intervention at the designated time. Table 3.1 indicates the summary statistics of their family backgrounds. 76% of the sample are Afghan children. Almost 72% of these Afghan migrants are undocumented. The remaining of 24% are Iranians. The proportion of girls to boys is approximately 2 to 3 in this sample.

Table 3.1: Summary Statistics for Children’s Background

Variables	mean	sd	min	max
Female	0.41	0.501	0	1
Age	12	2.93	8	19
Grade	4	2.19	1	10
Family Size	7	2.21	3	11
Birth Order	3	1.98	1	7
Afghans	0.76	0.44	0	1
Undocumented Afghans	0.72	0.45	0	1
IRSPRC, as their only option of schooling	0.59	0.5	0	1

Sample size = 29

In order to measure the level of their trust, I utilized representative questions from the General Social Survey (GSS) of behaviors and attitude such as “*Generally speaking, would you say that most people can be trusted or that you can’t be too careful in dealing with people?*” The questions ask about their friends, other students in the school, children and random people in the streets. The level of their pro-social behaviors is measured by simply asking them if they would like to do “a

good thing” for their friends, family, the school, and their neighbors³. Although this question was very general on its own, I did it on purpose to avoid inducing any answers. However, measuring trust or any other social behaviors through surveys has been criticized over time and considered an inconvenient approach due to their measurement errors (Carpenter et al, 2004). Most recent studies prefer to measure behavioral social capital in the context of experiment. However, the ethical issues limited this study to evaluate their social behaviors through an experiment. Therefore, further research is required to find the most harmless experiment to study the impact of incentives on their social behavior, and compare it with the survey responses to get a more reliable result.

In order to assess the level of their aspirations, children were asked what they would like to do when they grew up. They were allowed to choose any occupations they wanted, and I did not give them any limits.

In addition, for measuring their psychological factors, I replicated Wydick et al. (2013) in studying the impacts of child sponsorship on developing the aspirations of orphan children in four developing countries. Different facets of children’s drawings empirically correlated with various emotional disorders. Therefore, to capture children’s feelings through their drawing, they were asked to draw themselves on a rainy day.

³I had to remove the pro-social question that asked “whether you like to do a good thing for you neighbors” from data analysis due to some mistakes in gathering the data.

Chapter 4

Evaluation Strategy

4.1 Estimating the Average of Treatment Effect on Treated (ATT)

In order to estimate the causal effect of the incentive on school attendance, I utilize an Ordinary Least-Squares (OLS) model with a strong balanced longitudinal panel on students' attendance from week one to week seven. I hypothesize that students attend school more by receiving the intervention, while the null suggests there is no difference between average of attendance during treatment and control weeks. More specifically, I estimate:

$$Y_{it} = \alpha + \tau T_i + \beta X_i' + \varepsilon_{it} \quad (4.1)$$

By collapsing the data at the treatment level, Y_{it} is the average of attendance for student i during treatment and control weeks (t); T_i is the treatment status equal to unity if it is a treatment week (i.e. the school week that student i received ice cream on Saturday) and zero otherwise; X_i is a vector of control variables that includes grade of each student; residency status dummy variable (i.e. equal to 1 if student i is undocumented Afghan, and zero if a citizen/a permanent resident (base)); gender, and its interaction with treatment status to control gender differential; school type, a dummy variable to distinguish between enrolled students in the summer school who go to regular schools but doing some extracurricular activities in HN (equal to 1), and those that have this NGO as the only option of education (equal to 0); ε_{it} is the composite error term that is randomly assigned to each cross section unit, and assumed orthogonal to the treatment status and control variables. This study is a randomized experiment on street working children in the IRSPRC School. Therefore, I estimate the average effect of receiving the ice

cream incentive on the treated (ATT), as opposed to the average treatment effect (ATE) on the general population.

4.2 Survey Questionnaire

Since this study is a within-subject design experiment, the incentive was given to all present students, but at different times. Therefore it is not possible to provide a causal inference for their responses to initial and final survey questions across groups. Taking this into account, I run a paired t-test on pre and post-test results. This test only shows if there are any improvements. These improvements might be due to a correlation between participation in the program and children's social preferences/psychological well-being, but it cannot be referred to as a direct outcome of the incentive itself. This area may need further investigation by applying difference-in differences estimation or propensity score matching with a between subject design study.

Furthermore, I test the potential mechanism of the incentive with respect to children's initial level of aspiration and happiness. I include them as additional covariates to the equation (4.1) to control for the sample variability related to psychological factors. However, this inclusion requires more careful interpretation of the results for two important reasons. First, psychological factors might be highly correlated with each other or any other explanatory variables in the regression, which might cause collinearity. Second, measuring behavioral outcomes through self-reported surveys has been criticized over time because of their measurement errors (Carpenter et al, 2004) . Adding covariates to the experimental analysis place additional discretion in the hands of the experimenter, which might consciously or unconsciously bias the results. Hence, without making any causal claim, I would incorporate the initial level of children aspiration and happiness in the equation (4.1), as additional covariates. More specifically, I estimate the effect of treatment status T_i on average of attendance (Y_{it}) for student i in two different OLS models with two different set of covariates:

$$Y_{it} = \alpha' + \tau T_i + \beta X_i' + \gamma_1 \text{expectwhitecollar}_i + \gamma_2 \text{whitecollar} * \text{undoc}_i + v_{it} \quad (4.2)$$

The equation (4.2) has the same exact variables as (4.1), except it has two additional covariates: the initial level of children's aspiration and its interaction with being undocumented. This is to control for children's prior motivation for schooling. In order to interpret the large range of their answers to the aspiration question, I classify them into two categories: 1. If they expect to have occupations that require university education, I call them white collar jobs; 2. If they expect

to have occupations that do not need tertiary education, I call them blue collar jobs. Hence, I add a dummy variable, *expectwhitecollar*, equal to unity if student *i* expecting a white collar job (and zero otherwise) and its interaction with being undocumented to avoid their possible correlation.

$$Y_{it} = \alpha'' + \tau T_i + \beta X_i' + \theta_1 \text{HappyIndx}_i + \theta_2 \text{HappyIndx} * T_i + \mu_{it} \quad (4.3)$$

The equation (4.3) also has the same exact variables as (4.1), except it has two extra covariates: a happiness index, captured from their baseline drawing outcomes and its interaction with the treatment status. The use of drawing outcomes as an indicator of happiness has been used in Wydick et al. (2013) in studying the impact of child sponsorship on developing the aspirations of orphan children in four developing countries.

Adding all drawing outcomes, related to happiness, to the right hand side of a regression might reduce the degree of freedom and decrease the statistical power of the estimate. Therefore, I create a summary index for happiness, introduced by Anderson (2008), to avoid over-testing. Outcomes are demeaned and normalized, and then each element is weighted using the elements of the variable's corresponding row from the inverse of the covariance matrix that includes all variables within the relevant family (Anderson 2008). Weighing each variable by the sum of its corresponding row (or column) entries of the inverse covariance matrix allows variables that contain more unique information to have a higher weight in the summary index. Happiness index is created by four variables including: smiling self-portrait, using cheery colors, drawing positive body language, and also holding an umbrella or finding a safe shelter in the rain, in children's self-portrait figure.

Chapter 5

Results

5.1 Estimated Average Treatment Effect on Street Working Children

Figure 5.1 indicates summary statistics for average of attendance during control and treatment weeks. Table 5.1 shows the significant difference between the average of attendance during treatment weeks and control weeks. It suggests that children's attendance is .08 standard deviations more during treatment weeks than control weeks, with $p < .1$. This means that the school attendance is 12% higher in treatment weeks, a total of three, on average, as opposed to the other four, control weeks. Table 5.2 represents the results from equation (4.1), defined above, which indicates the impact of the intervention on children's school attendance. This, indeed, shows the significant difference in attendance, mentioned in table 5.1, is causal. As I expected, the findings indicate that receiving the incentive boosts the average of attendance for boys by 13 percentage points, statistically significant at 1%. In other words, this can be translated as 12 school days more in treatment weeks than the average of attendance in control weeks. This notable result is consistent with the existing literature regarding successful attendance incentives in different settings. Children were informed of the ice cream activity ahead of time, but it was their own decisions to either attend school and receive it or not. Given the notion of the unconditional intervention in this study, the incentive seems not to conflict with the intrinsic motivation of students. Therefore, the intervention appears to be causally successful in inducing more efforts to attend the school during the program.

In Addition, table 5.2 indicates gender differences play an important role in controlling the sample variability. It shows that a treated female student is less likely to attend school, compared to a treated male student. In the analysis of randomized controlled trials, adding an interaction of treatment with covariates

usually requires a careful interpretation. Therefore, I sorted the observations by students' gender (column 4 and 5) to check the robustness of the results. Likewise, the findings postulate the incentive has greater effect on male students. In other words, a treated boy is more likely to attend school by 13 percentage points during the program ($p < .01$). These interesting results, consistent with Levitt et al. (2012), indicate that boys are more responsive to short-term incentives, while girls are more likely to attend school regardless of receiving the intervention. Figure 5.2 shows girls' attendance is already higher than boys during control weeks. However, the incentive seems to stimulate boys to show up in school in which their average of attendance became at least as much as girls', during the treatment weeks. Girls might face more external and internal impediments for going to school than boys. As I mentioned earlier in the Section 2.2, gender differences in educational incentives do not only depend on children's intrinsic motivations, but also on the environmental factors and cultural norms. Calling attention to Burde et al. (2013) on studying the schooling of Afghan girls, and given the majority of girls in my sample are Afghans (10 out of 12), one possible explanation would be the role of school as a facilitator of commuting. This might smooth the Afghan families' conservative beliefs in sending their daughters to school alone. In addition, social workers in the school had provided social, and educational trainings to mothers in the past academic years. This could affect the awareness of mothers in the value of education for their daughters. Putting these two possible explanations together, it might suggest a higher prior motivations for girls to attend the school, and raise the possibility of underestimation in the treatment effect. I believe these remarkable findings, similar to the existing literature, may require further investigation especially in psychology and sociology literature to analyze the possible reasons on why the effectiveness of incentives with respect to the gender appears to be sensitive. This will be essential for policy makers to indeed consider the role of gender in different settings.

Another important covariate is residency status (i.e. being an undocumented student or a citizen/permanent resident). This variable eliminates the differences between students' social status, so that improves the precision of the estimated effect. During the program, it appeared undocumented students are more likely to attend school by almost 24 percentage points relative to a citizen/permanent resident ($p < .1$). Assuming all legal, illegal and local enrolled students to be at the same level of poverty, illegal students would face more social and economic disadvantages compared to their citizen/permanent resident peers, in Iran. These disadvantages go beyond losing the opportunity of schooling. For example, they may encounter difficulties at the time of sickness due to health care issues or finding a job in the labor market. In other words, an undocumented child has a lower level of social welfare compared to an Iranian child or even a legal Afghan

migrant with the same level of poverty. Figure 5.3 indicates how the treatment affects children’s attendance differently over their residency status.

Table 5.1: Summary Statistics for Average of Attendance

	Mean Treatment (Std. Dev.)	Mean Control (Std. Dev.)	Paired t-test (Std. Error)
Average of Attendance	.75 (.296)	.67 (.275)	.08* (.04)

Number of Observations=29; Mean Coefficients;
 $p < .001^{***}$, $p < .05^{**}$, $p < .1^*$

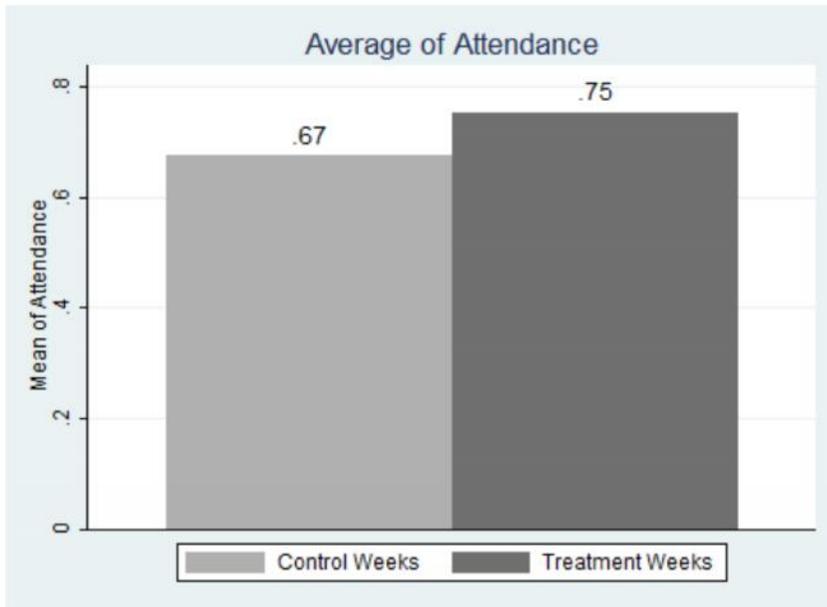


Figure 5.1: Average of Weekly Attendance

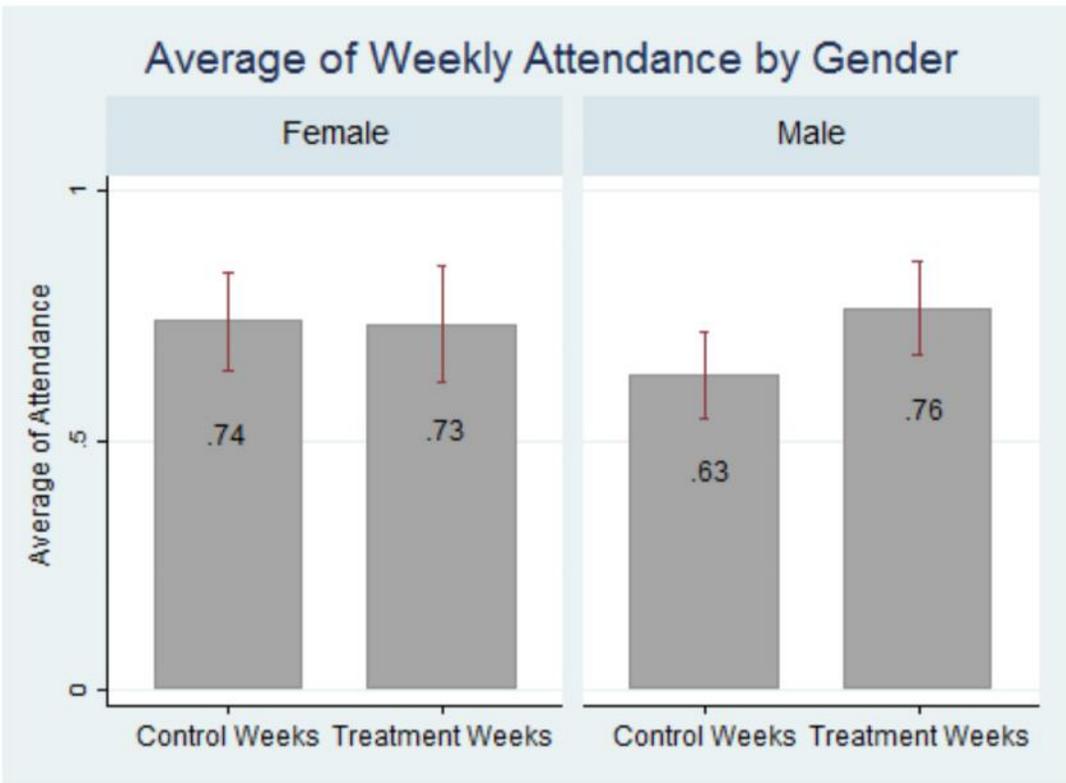


Figure 5.2: Average of Weekly Attendance by Gender

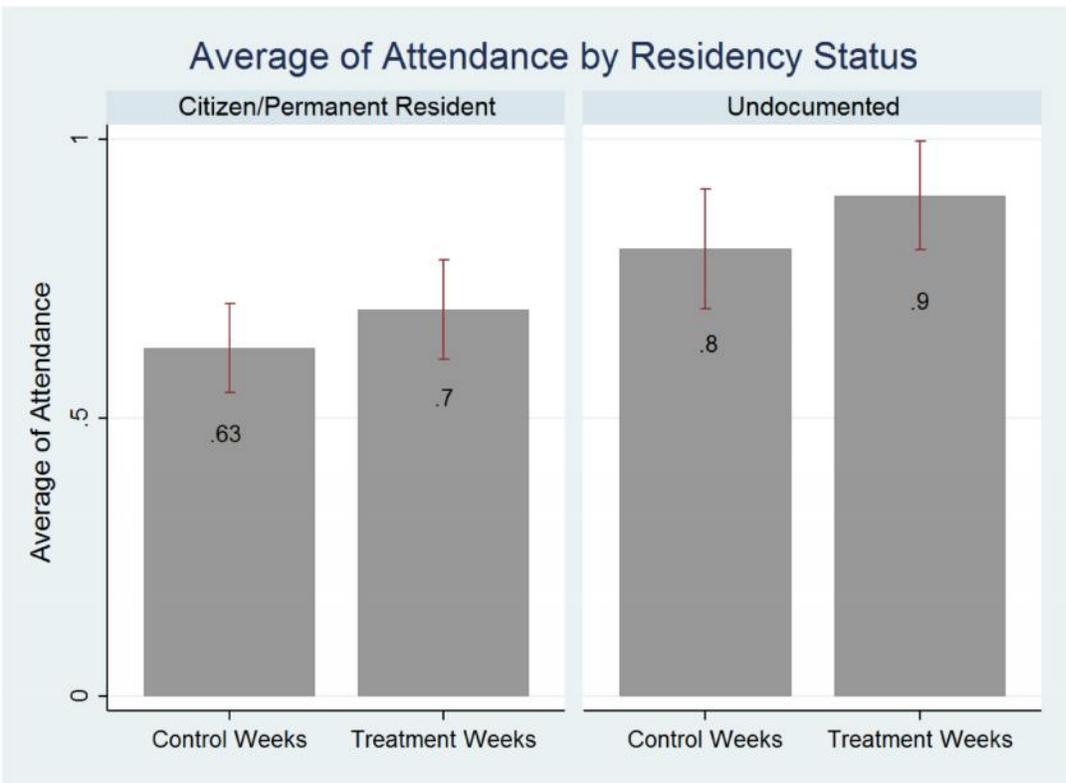


Figure 5.3: Average of Weekly Attendance by Residency Status

Table 5.2: OLS Estimation of the Average of Treatment Effect on Children’s Attendance

	(1) Attendance	(2) Attendance w/ Covari- ates	(3) Attendance w/ Interac- tion	(4) Male Attendance	(5) Female Attendance
Treat	0.0768* (0.04)	0.0768* (0.04)	0.134*** (0.05)	0.134*** (0.048)	-0.0048 (0.064)
Undocumented		0.236* (0.1301)	0.236* (0.131)	0.229 (0.187)	0.201 (0.208)
Grade		0.012 (0.024)	0.012 (0.024)	0.024 (0.03)	-0.022 (0.049)
IRSPRC School, as the only option		0.08 (0.121)	0.08 (0.121)	0.120 (0.160)	-0.026 (0.212)
Female		0.04 (0.105)	0.109 (0.112)		
Treat*Female			-0.139* (0.08)		
Constant	0.675*** (0.0531)	0.515*** (0.156)	0.486*** (0.157)	0.410** (0.185)	0.726*** (0.247)
Observations ¹	58	58	58	34	24
Number of Students	29	29	29	17	12

Standard errors in parentheses; $p < 0.01$ ***, $p < 0.05$ ** , $p < 0.1$ *

1

5.2 Survey Results

5.2.1 Social Behaviors

Table 5.3 provides summary statistics for comparing children’s social behaviors before and after the program. Paired t-tests indicate that street working children

¹Observations are average of attendance during the treatment and control weeks for each student. Basically, each student has two entry for their attendance, one is an average of attendance in the three treatment weeks, and one is the average of their presence in the 4 control weeks.

trust their friends .41 standard deviations less after the program, at 10 percent significance level. This decrease is non-conclusive and can be the result of anything including the intervention. Moreover, children trust random people in streets .17 standard deviations more after the program. It is possible that my presence as a stranger, who was giving them what they like, helped this improvement. More importantly, students show a higher level of aspirations after the program, .1 standard deviations with $p < 0.1$. These results cannot be referred to as a direct outcome of the incentive itself. However, they seem to be a potential area for further research.

Table 5.3: Summary Statistics for Questionnaire Analysis

	Mean (Before) (Std. Dev.)	Mean (After) (Std. Dev.)	Paired t-test (Std. Err.)
Patience	0.586 (0.501)	0.621 (0.494)	.034 (.135)
Trusting:			
Friends	1.41 (0.780)	1 (0.756)	-.414* (0.225)
Classmates	0.72 (0.922)	0.52 (0.871)	-.206 (0.206)
Random Children in Streets	0.206 (0.620)	0.103 (0.310)	-.103 (0.134)
Random People in Streets	0.241 (0.435)	0.413 (0.628)	.172* (0.1)
Cooperation with:			
Friends	1.72 (0.528)	1.79 (0.491)	.068 (0.11)
Family	2 0	2 0	0 0
School	1.93 (0.258)	1.82 (0.384)	-.103 (0.076)
Aspirations:			
Expecting White Collar Jobs	0.483 (0.509)	0.586 (0.501)	.103* (0.057)
Numb. of Students	29	29	29

Mean Coefficients; $p < 0.01^{***}$, $p < 0.05^{**}$, $p < 0.1^*$

5.2.2 Psychological Well-being

To capture street working children's psychological well-being, I replicated the approach of Wydick et al. (2013). In the last question of the questionnaire, each student was asked to draw a picture of him/herself on a rainy day with a new box of 24 colored pencils. The arrangement of seats did not allow students to see each other's drawings. Children's self-portraits and their respective psychological attributes have been analyzed in psychology literature for a long time (Wydick et al, 2013). Table 5.4 provides summary statistics for the 20 psychological characteristics of their drawings. Drawing outcomes are classified by their attributed emotional disorders. A carrot symbol “^” represents the measures for which a positive value represents a negative psychological outcome. These 20 characteristics were already chosen from the existing literature, and none were added or dropped after the experimental analysis began.

Referring to table 5.4, without making any causal claim, only 4 out of the 20 factors indicate a significant improvement after the program. However, all the signs before and after the program are as expected. Children use fewer dark colors (.21 std. dev.) and more cheery colors (.17 std. dev.) post-ante, both statistically significant at 10 percent. It implies that they show less anxiety and insecurity or depression after the program. Furthermore, in their post-drawings, they have less poor integration (.17 std. dev.) and also less erasure or scribble (.17 std. dev.), both with $p < .1$. This can be interpreted as they are less likely to be shy, or timid, but more confident after the program.

Table 5.4: Drawing Analysis of Psychological Factors Summary Statistics

Emotional Disorders Attributed to Drawing Outcomes	Mean After (Std. Dev.)	Mean Before (Std. Dev.)	Paired t-test (Std. Err.)
Aggressiveness:			
Huge figure	0.034 (0.186)	0 0	0.34 (.034)
Monster	0.034 (0.186)	0.069 (0.258)	-.034 (.060)
Long Arms	0.414 (0.501)	0.448 (0.506)	-.034 (.116)
Anxiety, Insecurity		,Depression	
Shading of face/body	0.655 (0.484)	0.552 (0.506)	.103 (.114)
Missing mouth or nose [^]	0.241 (0.435)	0.379 (0.494)	-.137 (.107)
Frowning or crying [^]	0.069 (0.258)	0.172 (0.384)	-.103 (.075)
Drawn in dark colors [^]	0.310 (0.471)	0.517 (0.509)	-.206* (.115)
Drawn in single color [^]	0 0	.069 (0.258)	-.069 (.048)
Weather (Thunder or Lightening)	-0.103 (0.489)	-0.069 (0.53)	-.034 (.092)
Low Self-esteem,		Shy, & Timid	
Tiny figure [^]	0.379 (0.494)	0.31 (0.471)	.069 (.110)
Poor integration of body [^]	0.655 (0.484)	0.828 (0.384)	-.172* (.100)
Missing arms or hands [^]	0.172 (0.384)	0.276 (0.455)	-.103 (.091)
Missing legs [^]	0.207 (0.412)	0.345 (0.484) ⁷	-.137 (.095)
Erasure marks, Scribble out [^]	0.138 (0.351)	0.31 (0.471)	-.172* (.087)
Low Self-Efficacy:			
Tiny head [^]	0.276 (0.455)	0.241 (0.435)	.034 (.105)
Short arms [^]	0.276 (0.455)	0.379 (0.494)	-.103 (.103)
Low Anxiety, High Self-efficacy²:			
Carry an umbrella /Sought shelter	0.483 (0.509)	0.621 (0.494)	-.137 (.095)
Body language	0.379 (0.561)	0.207 (0.559)	.172 (.157)
Smiling	0.655 (0.484)	0.517 (0.509)	.137 (.081)
Cheery colors	0.828 (0.384)	0.655 (0.484)	.172* (.086)
Numb. of Obs.	29	29	29

Mean Coefficients; $p < 0.01^{***}$, $p < 0.05^{**}$, $p < 0.1^*$ [^] indicates this measure is taken as “negative” indicators and the rest are positive ²²Referring to Happiness Index

5.2.3 Initial Mechanism

The results from equations (4.2) and (4.3), outlined above, are shown in table 5.5. Table 5.5 indicates that the treatment status is orthogonal to these covariates in which the estimated effect did not change by adding them to the regression, as was expected. In other words, in both estimation of equations, the incentive appears to enhance the probability of students attending school by 13 percentage points at 1 percent significance level. The results confirm that gender differences play an important role in which a treated female is less likely to attend school as opposed to a male treated student. Furthermore, with a cautious interpretation, it seems variation in psychological factors matter in testing the initial mechanism.

Table 5.5, column 2, represents the results from equation (4.2), which controls for the variations in the level of children's aspirations. An undocumented student with higher aspirations (i.e. expecting white collar occupations that need tertiary education) is more likely to attend school during the program relative to his or her citizen/permanent resident peer (by 56 percentage points at 1% significance level). It seems the illegal students take good advantage of their only option of education in HN. However, there is a very counterintuitive point about the results. In table 5.5, column 2, the estimated sign for higher expectation is negative, which is against my anticipation. I added this variable to control for the prior motivation of schooling. I expected a positive estimate that reflected the idea that higher motivations may lead to higher attendance. Figure 5.4 indicates, in detail, a student with lower aspirations apparently attends school more often than a student with higher expectations. However, both students appear to show up in treatment weeks more than control weeks. This study is limited to provide any causal estimation on the effect of the incentive on students' aspiration post-ante. This could be also another potential area for future research in aspirations literature to investigate what might derive these counterintuitive results.

Column 3, results from equation (4.3), also indicates there is not a notable difference between equation (4.1) and (4.3) in the estimations with different sets of covariates, but (4.3) has slightly higher standard errors and a lower degree of freedom. This may suggest the level of happiness does not vary that much across the subjects. However, this is a very strong claim to make and definitely requires further investigations.

Table 5.5: OLS Estimation of the ATT with Psychological Factors

	(1)	(2)	(3)
	Attendance	Attendance	Attendance
	W/	W/	W/
	Covariates	Aspirations	Happiness
Treatment	0.134*** (0.0506)	0.134*** (0.0506)	0.138*** (0.0514)
Undocumented	0.236* (0.131)	-0.0580 (0.187)	0.242* (0.133)
Grade	0.0122 (0.0244)	0.00618 (0.0212)	0.0223 (0.0298)
IRSPRC school, as the only option	0.0798 (0.121)	0.112 (0.105)	0.0606 (0.126)
Female	0.109 (0.112)	0.198* (0.104)	0.134 (0.119)
Treat*Female	-0.139* (0.0786)	-0.139* (0.0786)	-0.147* (0.0806)
White collar expect- ation (Initial)		-0.330*** (0.110)	
(Undocumented× White Collar)		0.562** (0.219)	
Happiness Index			0.0845 (0.112)
Happy Indx×Treat			-0.0392 (0.0646)
Constant	0.486*** (0.157)	0.583*** (0.139)	0.445*** (0.172)
Observations	58	58	58
Numb. of Students	29	29	29

Standard errors in parentheses; $p < 0.01^{***}$, $p < 0.05^{**}$, $p < 0.1^*$

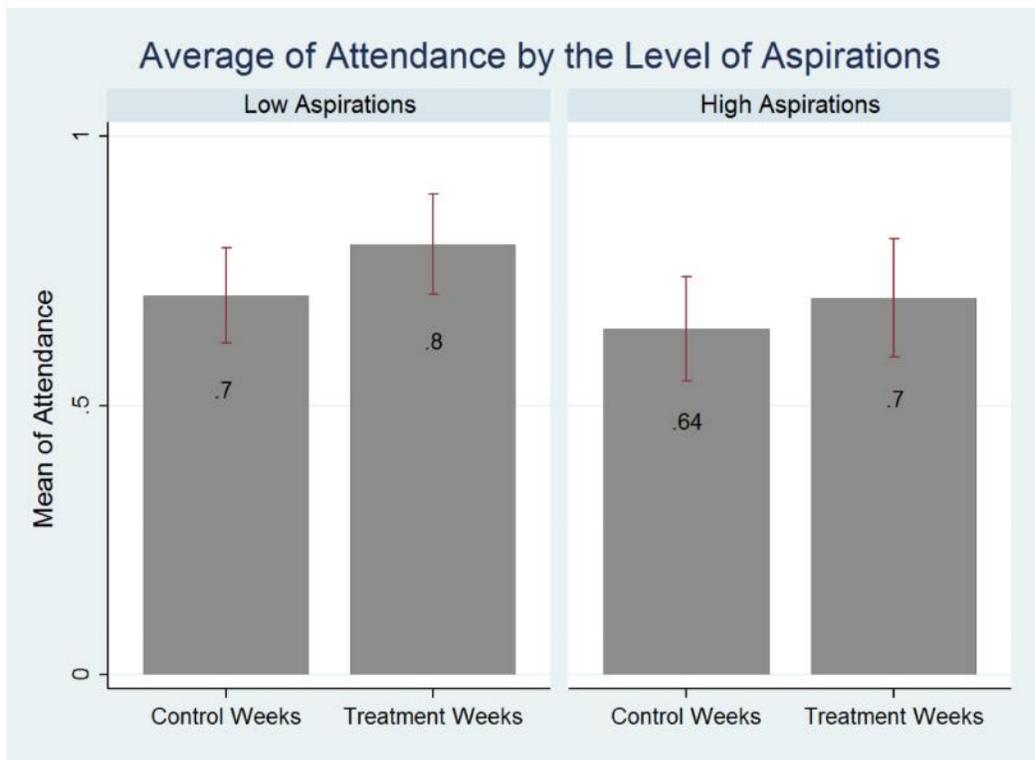


Figure 5.4: Average of Attendance by the Level of Aspirations

Chapter 6

Robustness Check

Some questions arise regarding the estimation of the average of treatment effect on students' attendance. First, one would mention the time component effect. The duration of the experiment was too short, 7 weeks, to take on anything that could have been compounded with the causal treatment effect. However, I collapsed the data at treatment level to get the average of attendance in treatment and control weeks. This was to take out the time element, and show the variation between individuals. Therefore, this eliminates any possibility of students' attendance being correlated with each other in the 7 weeks of the summer school, which could have biased the results.

Moreover, another question might be whether there was any exogenous event that happened to occur during the program. The only thing I would think of is the warm weather in the summer, which was reported as one of the warmest summers in Tehran's history by local news. Having ice cream in the summer heat might be a good reason to show up in school more. However, the ice cream was only given on Saturday of each treatment week, and the students were aware of it. Figure 6.1 breaks down the overall average of attendance to all Saturdays and Wednesdays during the program. It indicates attendance is higher, on average, on all Saturdays and Wednesdays of treatment weeks regardless of the designated day for the ice cream activity (i.e. only on Saturdays). Therefore, this would also reject the possibility of the treatment effect overestimation.

Moreover, due to the randomized experiment, there are two students: a girl at the age of 18 and a boy at the age of 19, which can be considered as outliers. There is a possibility that the ice cream incentive might not work on them the way it does on younger children. Therefore, it might underestimate the effect of the treatment. Studies such as Berry (2013) and Levitt et al. (2012) find younger students, at primary level, are more responsive to non-financial incentives. In contrast, older students at secondary level are more responsive to high value financial incentives, but not low. In this study, it does not seem to be the case since the classification

of students is not based on their ages, but their knowledge. Therefore, it might contrast the findings in the existing literature. However, as a robustness check, I treated these two students as outliers and eliminated them from the observations. This is to check if the estimate is robust to elimination of outliers. From table 6.1, results represent that omitting the outliers just makes a slight increase in the estimated effect from 13 percentage points to 14. The treatment status still enhances school attendance at 1 percent significance level. Gender differential and being undocumented are still the significant covariates in controlling the sample variability. However, the estimates are a bit noisy (i.e. higher standard errors).

Finally, I checked the robustness of the estimated ATT with respect to different specifications. The observations are shaped in a strong longitudinal panel data so that it makes more sense to apply a linear model for estimating the ATT. However, I attempt to evaluate the impact of the incentive on children's attendance by utilizing bivariate logit and probit models to compare the results with a linear probability model. Table 6.2 shows the estimates are robust to the change in strategies although they show a slight increase in the average treatment effect. Therefore, I would say the results in this study are robust. They show incentives matter in enhancing the school attendance causally, in this context, in spite the fact that it was a summer school, and there was a possibility that children might not take it as seriously as an academic year.

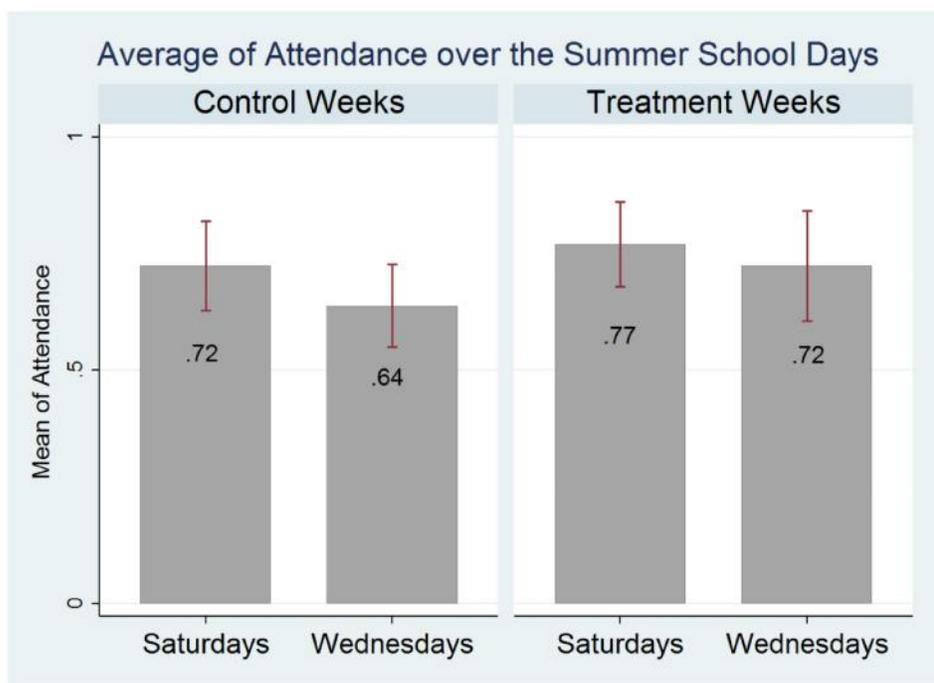


Figure 6.1: Average of Attendance during the Program

Table 6.1: OLS Estimation of the ATT without Outliers

VARIABLES	Attendance w/out Outliers	Attendance w/out Outliers w/Covariates	Attendance w/out Outliers w/Interaction	Male Attendance w/out Outliers	Female Attendance w/out Outliers
Treat	0.0825* (0.043)	0.0825* (0.0430)	0.143*** (0.0537)	0.143*** (0.0506)	-0.00519 (0.0701)
Undocumented		0.251* (0.146)	0.251* (0.146)	0.198 (0.233)	0.308 (0.197)
Grade		-0.00148 (0.0302)	-0.00148 (0.0302)	0.0166 (0.0442)	-0.0380 (0.0458)
IRSPRC School, as the only op- tion		0.110 (0.124)	0.110 (0.124)	0.115 (0.168)	0.0770 (0.200)
Female		0.00263 (0.108)	0.0767 (0.116)		
Treat*Female			-0.148* (0.0842)		
Constant	0.651*** (0.055)	0.541*** (0.172)	0.511*** (0.173)	0.449* (0.242)	0.685*** (0.225)
Observations	54	54	54	32	22
Numb. of Students	27	27	27	16	11

Standard errors in parentheses; $p < 0.01$ ***, $p < 0.05$ ** , $p < 0.1$ *

Table 6.2: Bivariate Probit, Logit, and Linear Probability Estimation of the ATT

	(1) LP Model	(2) Probit Model Marginal Effects	(3) Logit Model Marginal Effects
Treatment	0.134** (0.0552)	0.156** (0.063)	0.140** (0.064)
Undocumented	0.233* (0.130)	0.263* (0.135)	.267* (0.141)
Grade	0.0152 (0.0242)	0.023 (0.0258)	0.023 (0.026)
IRSPRC School, as the only option	0.0802 (0.120)	0.065 (0.119)	0.065 (0.119)
Female	0.113 (0.110)	0.122 (0.112)	0.124 (0.112)
Treatment*Female	-0.139 (0.0859)	-0.155 (0.099)	-0.154 (0.099)
Constant	0.474*** (0.155)	-0.201 (0.549)	-0.355 (0.944)
Observations	348	348	348
Numb. of Students	29	29	29

Standard errors in parentheses; $p < 0.01$ ***, $p < 0.05$ ** , $p < 0.1$ *

Chapter 7

Conclusion

Education plays a significant role in economic growth, and development at micro, and macro level, in an economic perspective. As Nelson Mandela well said “*Education is the most powerful weapon which you can use to change the world.*” Therefore, a large body of literature has focused on educational attainment to find cost-effective solutions to lower the opportunity cost of schooling for children living in poverty. Recently, behavioral economics moved their focus more toward educational incentives that seem to matter in changing people’s behavior more efficiently. While some studies indicate incentives are effective in altering people’s decisions, by inducing more effort and higher performance, other works point to crowding out of intrinsic motivations and other externalities. It appears incentives mechanisms can improve behavioral outcomes including schooling decisions depending on how they are designed; how they are given to subjects; when they are implemented; and more importantly how they interact with internal motivations (Gneezy et al. 2011).

This study reports the results of an experiment conducted with children usually working in the streets of Tehran, Iran, on the effectiveness of non-monetary incentives on school attendance and related behaviors. The vulnerability of the subject pool restricted my experimental design and potential incentives seemed to work in the literature. Therefore, I utilize a within-subject design consisting of making ice cream at alternating dates and giving it to all children present in that day at the NGO school. The findings indicate the intervention boosts the average of children’s school attendance by 13 percentage points, with $P < .01$ in treatment weeks compared to control weeks. Estimation of the ATT, shows that gender plays an important role in the effectiveness of the intervention. Consistent with the literature, the findings suggest that boys are more responsive to non-monetary incentive, as opposed to their female classmates. However, girls already show higher motivation in attending school regardless of receiving the intervention. In addition, without making any causal claims, initial and final survey results in-

icate an overall improvement in children's level of aspirations and psychological well-being after participation in the program. In other words, children appear to express higher aspirations (i.e. refer to expecting occupations with higher education requirements) post-ante, and show heterogeneous changes in the level of their trust. Further captured by drawings, children seem to be less anxious, less timid and more confident. However, the limitation of this study does not allow me to provide a causal inference for their responses to initial and final survey questions. This requires further investigation with a between subject design by applying difference-in differences estimation or Propensity Score Matching as alternatives to still take their vulnerability into account.

This study, consistent with the literature, indicates that "incentives matter" in changing people's behaviors. This research provides strong evidence that non-monetary incentives, preferred for their cost-effectiveness, seem to work in enhancing school attendance. This would add to this line of research by providing a new source of dataset in a developing country. It is important for policy makers to direct their funds more towards effective interventions, especially in early childhood. In addition, this study, similar to the literature, shows gender differences matters in responding to the external incentives. Therefore, policy makers should understand gender differences in interventions related to education to improve educational attainment and performance of all youth, female and male alike. Taking psychological factors into account through the channel of behavioral economics seem to contribute not only to economics literature but also psychology. This is due to carrying out the causal relationships rather than correlations, with less measurement error by using econometric tools. This study can contribute to develop a common framework to promote interdisciplinary exchange.

Although further research is required to test the external validity of my findings, and remove its limitation (e.g. small sample size, and having only a within subject design), this experiment would be a solid starting point for further investigation.

Bibliography

- [1] Angrist, J. D., & Lavy, V. (May 2004). The Effect of High Stakes High School Achievement Awards : Evidence from a School-Centered Randomized Trial
- [2] Arends-Kuenning, M., & Amin , S. (2000). The Effects of Schooling Incentives Programs on Household Resource Allocation in Bangladesh.
- [3] Barrera-Osorio, F., Bertrand, M., Linden, L. L., & Perez-Calle, F. (2008). Conditional Cash Transfers in Education Design Features, Peer and Sibling Effects Evidence From a Randomized Experiment in Colombia. Retrieved from <http://www.nber.org/papers/w12890>
- [4] Benabou, R., & Trole, J. (2003). Intrinsic and Extrinsic Motivation. Review of Economic Studies.
- [5] Berry, J. (2013). Child Control in Educational Decisions: An Evaluation of Targeted Incentives to Learn in India.
- [6] Brunello, G., & Schlotter, M. (2011). Non-cognitive skills and personality traits: Labor market relevance and their development in education and training systems.
- [7] Buchmann, C., DiPrete, T., & McDaniel, A. (2007). Gender Inequalities in Education.
- [8] Burde, D., & Linden, L. L. (2013). Bringing Education to Afghan Girls: Randomized Controlled Trial of Village-Based Schools. American Economic Journal. Retrieved from <http://dx.doi.org/10.1257/app.5.3.27>
- [9] Cardoso, E., & Portela Souza, A. (2004). The Impact of Cash Transfers on Child Labor and School Attendance in Brazil. 52.
- [10] Carpenter, J. P., Daniere, A. G., & Takahashi, L. M. (2004). Cooperation, Trust, and Social Capital in Southwest Asia Urban Slums. Journal of Economic Behavior & Organization, 55(2004)533-551.

- [11] Cunha, F., Heckman, J. J., & Schennach, S. (2010). Estimating the technology of cognitive and non-cognitive skills formation.
- [12] Deuflo, E., & Kremer, M. (2013). Use of Randomization in the Evaluation of Development Effectiveness.
- [13] Duflo, E., & Hanna, R. (2005). Monitoring works: Getting Teachers to Come to School. Retrieved from <http://www.nber.org/papers/w11880>
- [14] Duflo, E., Kremer, M., & Dupas, P. (2010). Peer Effects, Teacher incentives, and the Impact of Tracking: Evidence from a randomized Evaluation in Kenya.
- [15] Edmonds, E. V., & Shrestha, M. (2013). You Got What You Pay for: Schooling Incentives and Child Labor.
- [16] Glewwe, P. (2002). Schools and Skills in Developing Countries: Education Policies and Socioeconomic Outcomes. *Journal of Economic Literature*, XL, 436-482.
- [17] Glewwe, P., Philip, H. R., & Wydick, B. (2013). Developing Aspirations: The Impact of Child Sponsorship on Self-Esteem and Life Expectations.
- [18] Greenzy, U., Meier, S., & Pedro, R. B. (2011). When and Why Incentives (Don't) Work to Modify Behavior. *American Economic Journal*, 25(4), 191-209. Retrieved from <http://www.jstor.org/stable/41337236>
- [19] Gustafsson-Wright, E., & Pyne, H. H. (2002). Gender Dimension of Child Labor and Street Children in Brazil. The World Bank.
- [20] Haushofer, J., & Shapiro, J. (n.d.). Household Responses to Income Changes: Evidence From an Unconditional Cash Transfer Program in Kenya. 2013.
- [21] Heckman, J. J. (1999). Policies to Foster Human Capital. Retrieved from <http://www.nber.org/papers/w12006>
- [22] Heckman, J. J. (2011). Integrating Personality Psychology into Economics. Retrieved from <http://www.nber.org/papers/w17378>
- [23] Heckman, J. J., & Materov, D. V. (2007). The Productivity Argument for Investing in Young Children.
- [24] Heckman, J. J., & Rubinstein, Y. (2001). The Importance of Non-cognitive Skills: Lessons from the GED Testing Program. *American Economic Review*, 91(No.2).

- [25] Heckman, J. J., Pinto, R., & Savelyev, P. (2012). Understanding the Mechanism Through Which an Influential Early Childhood Program Boosted Adult Outcomes. (No. 7040).
- [26] Holmlund, H., & Silva, O. (2009). Targeting Non-cognitive Skills to Improve Cognitive Outcomes: Evidence from Remedial Education Intervention. IZA(No. 4476).
- [27] Kremer, M., & Miguel, E. (2004). Worms: Identifying Impacts on Educational and Health in the Presence of Treatment Externalities. *Econometrica*, 72(1,159-217).
- [28] Kremer, M., & Vermeersch, C. (2004). School Meals, Educational Achievement and School Competition: Evidence from a Randomized Evaluation.
- [29] Kremer, M., Glewwe, P., & Moulin, S. (2000). Textbooks and Test Scores: Evidence from a Prospective Evaluation in Kenya.
- [30] Levitt, S. D., List, J. A., Neckermann, S., & Sadoff, S. (2012). The Behavioral Goes to School: Leveraging Behavioral Economics to Improve Educational Performance .
- [31] Naef, M., & Schupp, J. (2009). Measuring Trust: Experiments and Surveys in Contrast and Combination. (4087).
- [32] Schultz, T. P. (2001). 2001. School Subsidies for the Poor: Evaluating the Mexican Progressa Poverty Program.
- [33] Schunk, D. H. (1985). Participation in Goal Setting : Effects on Self-efficacy and Skills of Learning Disabled Children. *Journal of Special Education*(19,307-317).
- [34] Skoufia, E., & McClafferty, B. (International Food Policy Research Institute). 2001. Is Progressa Working? Summary of the Results of an Evaluation by IFPRI.(118).
- [35] Tough, P. (2012). How Children Succeed: Grit, Curiosity, and the Hidden Power of Character. New York and Boston: Houghton Mifflin Harc.

Appendix

Survey Questionnaire

1) Gender: male female

2) Age:

3) Class currently attended: preschool 1st grade 2nd grade 3rd grade

4th grade 5th grade

4) How many siblings do you have? List their age and gender

5) Who do you live with?

6) Who takes care of you? Both parents, mom, dad, grandparent, uncles, friends, institution, siblings, I am on my own

7) What would you like to do when you grow up:

8) Would you say most of your friends can be trusted and helpful or not?

Not at all, only a bit, yes most of the time, I don't know

9) Would you say most children you meet in this school (not your friends) can be trusted and helpful or not? Not at all, only a bit, yes most of the time, I don't know

10) Would you say most children you meet in the street (not your friends) can be trusted and helpful or not? Not at all, only a bit, yes most of the time, I don't know

11) Would you say most adult you encounter in the street (not your family/friends) can be trusted and helpful or not? Not at all, only a bit, yes most of the time, I don't know

12) Do you like to do something good for your friends?

Not at all, only a bit, yes most of the time, I don't know

13) Do you like to do something good for your family?

Not at all, only a bit, yes most of the time, I don't know

14) Do you like to do something good in your school?

Not at all, only a bit, yes most of the time, I don't know

15) Do you like to do something good for your neighbors? Not at all, only a bit, yes most of the time, I don't know

16) If you were to choose between 1 piece of cake today or 2 pieces next week, which one would you prefer

- Draw yourself in a rainy day: