

The Economics of Adolescents' Time Allocation:  
Evidence from the Young Agent Project in Brazil

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## **ABSTRACT**

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What are the socioeconomic implications of the time allocation decisions made by low-income adolescents? The way adolescents allocate their time between schooling, labor and leisure has important implications for their education attainment, college aspirations, job opportunities and future earnings. This study focuses on adolescents and young adults in urban areas of Brazil that, due to household income constraints, family or peer pressures enter the labor market at an early age, stop studying, and/or start engaging into risky behaviors, such as drug use or sexual activities. The key policy question in this context is then: what incentives could prove an efficient tool to change the time allocation patterns and behaviors that make adolescents drop out of school, fall pregnant (or impregnate) or consume drugs?

This dissertation uses data from the Young Agent Project (YAP) a Conditional Cash Transfer (CCT) Program targeting exclusively adolescents in Brazil to examine this issue. This program targets adolescents aged 15 to 17 and its goals are to improve the socioeconomic and educational outcomes of youth in Brazil. The research in the dissertation seeks to determine whether the program has indeed influenced or not the time allocation decisions of low-income youth in Brazil, thus improving their socioeconomic and educational outcomes.

The research addresses this issue in three different levels of analysis: 1) whether the YAP has affected schooling outcomes, youth labor decisions and risky behaviors, by gender, ethnicity or region, 2) whether transferring cash directly to the adolescent is more efficient than transferring to the parents, on improving schooling, labor and risky behavior outcomes,

and 3) Whether the number of hours per week dedicated to the YAP's after school program is a strong predictor of better outcomes.

The data used is the 2006 *Projeto Agente Jovem* dataset, which is a matched non-experimental, with a treatment group and a constructed control group. This dataset is representative of the recipients of the YAP across regions, states, genders and racial composition, which was administered to 2,210 households with adolescents aged 16 to 20 at least one year after having finished the program. For the analysis, this study used econometric techniques such as Propensity Score Matching (Average Treatment Effect on the Treated, Nearest Neighbor with Replacement) and performed robustness checks with a sensitivity analysis by comparing the treatment effects obtained from linear regression and Inverse Probability of Treatment Weighting.

The main findings from this dissertation suggest that there is a positive impact of the program on school grade completion and college aspirations and less likely to be idle particularly for females, *Pardos*, Blacks and adolescents from the Southeast region. Despite these positive effects, former YAP participants are more likely to combine work and study and more likely to be age grade delayed and held informal jobs. Regarding risky behaviors, this dissertation finds increased use of contraceptives among the treatment group. Although, there were no reductions in teen pregnancy, the higher use of contraceptives is consistent with reductions in unplanned pregnancies among females and the 18 – 20 age subgroup. The results also suggest that transferring cash directly to the adolescent may have positive effects, improving schooling, labor and risky behavior outcomes. Furthermore, the program dosage analysis indicated that students who attended the program more than 16 hours per week have higher middle and high school completion rates as well as college aspirations.

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## **Abbreviations**

ASPs: After School Programs

BDH: Bono de Desarrollo Humano

GDP: Gross Domestic Product

CCTs: Conditional Cash Transfers

IBGE: Instituto Brasileiro de Geografia e Estatística IBGE (Institute of Geography and Statistics Instituto Brasileiro de Geografia e Estatística IBGE)

PETI: Programa de Erradicacao do Trabalho Infantil

PNAD: Pesquisa Nacional Amostra por Domicilios

PRAF: Programa de Asignación Familiar- Honduras

RPS: Nicaraguan, Red de Protección Social

YAP: Young Agent Project

STDs : Sexually Transmitted Diseases

PeNSE: Pesquisa Nacional de Saude Escolar (National Survey of Schooling Health)

## **Glossary**

Bono de Desarrollo Humano: Ecuador's Cash Transfer

Bolsa Familia : Conditional Cash Transfer Program from Brazil

Bolsa Escola and Fome Zero: Previous conditional cash transfer in Brazil before the unification of all programs into Bolsa Familia.

Cr terio Brasil: is a measured used by the Brazilian Government as a proxy for socioeconomic status of the household. It takes into account consumption patterns, education attainment of the head of the household.

DataUff : N cleo de Pesquisas Sociais Aplicadas, Informa es e Pol ticas P blicas da Universidade Federal Fluminense de Niter i – Brasil

Favelas: common word used in Brazil for slums or a shantytowns and refers to neighborhoods of irregular settlements or invaded properties within the city

Pretos: Refers to an ethnic category created in Brazil to describe individuals of mixed ethnicities: white, black and native.

PROGRESA/Oportunidades: Conditional Cash Transfer in Mexico

PROUNI : Federal government program that provides scholarships to private universities for low-income students.

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## CHAPTER 1.

### INTRODUCTION

What are the socioeconomic implications of the time allocation decisions made by low-income adolescents? The way adolescents allocate their time between schooling, labor and leisure has important implications for their education attainment, college aspirations, job opportunities and future earnings. This study focuses on adolescents and young adults in urban areas of Brazil that, due to household income constraints, family or peer pressures enter the labor market at an early age, stop studying, and/or start engaging in risky behaviors, such as drug use or sexual activities. Due to age-related characteristics and a violent environment in the *Favelas*,<sup>1</sup> adolescents from low-income backgrounds might be more likely to incur in risky sexual behaviors and drug consumption. They also tend to have relatively higher dropout rates and labor force participation.

The key policy question in this context is then which incentives could prove an efficient tool to change the time allocation patterns and behaviors that make adolescents drop out of school, fall pregnant (or are impregnated) or consume drugs? This dissertation uses data from the Young Agent Conditional Cash Transfer (CCT) Program in Brazil to examine this issue. This program targets adolescents aged 15 to 17 and its goals are to improve the socioeconomic and educational outcomes of youth in Brazil. The research in the dissertation seeks to determine whether the Young Agent Program YAP has influenced or not the time allocation decisions of low-income youth in Brazil, thus improving their educational outcomes while reducing their early entrance to the labor market and the consumption of risky behaviors.

The research addresses this issue at three different levels of analysis: 1) whether the YAP has affected schooling outcomes, youth labor decisions and risky behaviors, by gender,

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<sup>1</sup> *Favelas* is the common word used in Brazil for slums or shantytowns and refers to neighborhoods of irregular settlements or invaded properties within the city (as in the hills of Rio de Janeiro) or in the suburbs (as in the city of Sao Paulo). It is estimated that about 6 percent (11.4 million) of the population lived in slums in Brazil in 2010 (IBGE/Census, 2010).



ethnicity or region, 2) whether transferring cash directly to the adolescent is more efficient for improving schooling, labor and risky behavior outcomes, than transferring the transfer to the parents and 3) Whether the number of hours per week dedicated to the Young Agent Project after school program is a strong predictor of better outcomes.

Studying the impact of the YAP on adolescent behaviors is crucial now that Brazilian education has shifted from equalizing access to improving learning and lengthening school retention. While enrollment rates at lower levels have increased, there is a concern about how much learning is acquired by students and about the high dropout rates, age grade delays, among low-income adolescents. There is a policy shift to consider issues such as teen pregnancy, gang and drug involvement, family instability (e.g. unemployment, domestic violence, homelessness); as crucial determinants of learning and school attainment (Bruns, Evans & Luque, 2011). There is a serious concern with how low-income adolescents allocate their time and how this may help in understanding the dynamics of school dropouts, absenteeism, youth labor market participation, and risky behaviors.

The YAP is part of a Conditional Cash Transfer (CCT) initiative. Many CCT programs have been extensively analyzed in the literature. Most of the attention has been given to the positive effects on school enrollment and attendance, and the mixed effects the programs appear to have on child labor. Little has been studied about the effects of CCTs on school grade completion, age grade delays and labor decisions in urban areas among adolescents (Rawlings & Rubio, 2005; Cardoso & Portela Souza, 2004). This dissertation focuses precisely on these issues. Furthermore, while CCT's have commonly used a child labor theoretical framework in which decisions between schooling and labor is made by the parents (Berhman, Parker, & Todd, 2007; Edmons & Schady, 2009), this study places the adolescent at the center of the decision-making. Adolescents make decisions between studying only, working only, combining work and study or inactivity (idleness). In addition,

the research will seek to integrate the relation between schooling, labor market and risky behaviors among adolescents. The study of time allocation patterns among adolescents and the role of incentives on schooling, labor and risky behavior outcomes is in part possible thanks to the special features of the YAP in Brazil among adolescents aged 15 to 17.

### **Description of The Young Agent Project**

Conditional cash transfers (CCT) are programs that aim to reduce poverty and inequalities by transferring money to households who meet certain income criteria, conditional on enrolling children into public schools, getting regular check-ups at the doctor's office, receiving vaccinations, or the like. The YAP is a small component of *Bolsa Familia*, a larger Conditional Cash Transfer (CCT) program in Brazil covering families with children in school from early childhood through high school.<sup>2</sup> The YAP targets only urban adolescents aged 15 to 17, and it is conditional on the attendance of both schooling and a federally provided after school program. Unlike other CCTs such as *PROGRESA/Oportunidades* in Mexico, the YAP was never randomized.<sup>3</sup> By the time of the *Projeto Agente Jovem* survey in 2006, there were 112,536 beneficiaries between the ages of 15 to 17 (MDS, 2006). The participation in the program can have a length of one and up to two years between the 15<sup>th</sup> and the 17<sup>th</sup> anniversary of the student. The aim of the YAP is to keep adolescents in school, out of work, prevent violent and risky behaviors as well and to make them community leaders in their own *Favelas* (Brandão et. al, 2008). The special feature of the Young Agent Project is that the transfer is conditional on the attendance of at least 80 percent of the time to both schooling and a government provided after-school program. Furthermore, the YAP is flexible in transferring the cash directly to the adolescent, to the parents, legal guardian or

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<sup>2</sup> *Bolsa Familia* gives a subsidy of R\$70.00 (US\$35) to families conditional on school attendance and in some cases health check-ups and vaccination. Additional amounts are given for children between the ages of 6-15 varying according to the number of children in the family (one child R\$15, two R\$30 or three R\$45 (US\$8 – US\$22). Eligibility is based on household income and the transfer is limited to three children and is given to the mother of the adolescent. The program requires the attendance of at least 85 percent of the monthly school days for school-age children, updated immunization cards for children less than seven years old and regular visits to health care centers for pregnant women.

<sup>3</sup> This has been a general trend for social programs in Brazil since the first CCTs since the early 90's with the governments of Fernando Henrique Cardoso and Lula.

family member. The decision to allow the transfer to go to the adolescent or to a family member is explained by the age of beneficiaries (15 to 17) and to the fact that in many cases these young individuals do not live with their mothers.

Adolescents' households are eligible when fulfilling a maximum income criteria of R\$120 (approximately \$60US) in 2009. The transfer was R\$65 per month (approximately \$33US) for each participating per adolescent enrolled in the program. Additional funds are sent directly to the After School Program offering activities in each municipality.

### **Statement of the Problem**

In the last two decades, Brazil has experienced an enormous expansion of government social programs, particularly CCTs (today centered in *Bolsa Familia*) to reduce poverty and inequalities among families, children and adolescents. Still today, despite strong economic growth in the last decades, poverty and inequalities remain one of the main social problems for Brazil. Approximately 28 percent of its population is in poverty and remains one of the ten most unequal countries in the world (PNAD, 2009).

Even though school attendance and enrollment have improved overall in the last decade in Brazil, by 2007 it was estimated that only 82 percent of the age group from 15 to 17 were in school. Of that 82 percent, 44 percent were still in middle school and only 48 percent were in upper middle and 42 percent ages 18 to 24 were still attending elementary, middle or high school (IBGE/PNAD, 2009). In 2007 it was estimated that 10 percent of students in middle and high school had dropped out; this is the highest dropout rate among *Mercosul* countries (Mercosul Educational, 2007). This suggests that either there is a strong grade overage, that children are either entering the educational system at an older age, or they are continuously dropping out to work and then coming back into the system. In 2008, it was estimated, for example, that 10.1 percent of children and young adults between the ages of 10

and 19 were working (IBGE/PNAD, 2008). Within the age group 18 to 24,<sup>4</sup> 14.7 percent declared that they studied only and 15.6 percent declared that they studied and worked simultaneously, while almost half declared that they worked only and 17.8 performed domestic duties. Poverty and a double school day in Brazil in which children attend school only 4 to 5 hours per day (either in the morning or the afternoon) can easily accommodate both schooling and labor. Poverty, low educational attainment and lack of opportunities or prospects for the future might also increase the likelihood that a young woman will become pregnant as a teen or that an adolescent will develop risky behaviors. In 2008, it was calculated that in Brazil, 75.1 for every 1,000 adolescents ages 15-19 were pregnant, one of the highest in the world (UNICEF, 2010). Brazil is ranked fifth in the world in homicide rates of young people ages 15 to 24 years, with 63 homicides per 100,000 inhabitants (WHOSIS, 2008). These trends can be explained in part because parents are not supervising adolescents. Time allocation and poverty seem to be important determinants of school, labor and risky behaviors outcomes among adolescents in Brazil.

### **Objectives and Purpose of this Research**

This study aims to understand whether programs targeting the age group 15 to 17, providing a special constraint on time allocation (by occupying twice as much of the adolescents' time with an after school program) and transferring cash directly to students, can positively affect schooling, labor and risky behaviors. Conditional Cash Transfers are an important and necessary incentive to achieving greater educational equality and increasing future earnings of youth from low socio economic backgrounds. Expanding the knowledge on the role of incentives on youth behavior and decision-making is crucial to improving existing public policies in education, labor market and health policies targeting adolescents. Direct cash incentives or direct non-monetary incentives to adolescents could be an effective

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<sup>4</sup> I will use the definition of Youth based on the Pan American Health Organization and the Health World Organization (HWO), for which ages comprised of "youth" are 15 to 24 years.

tool to change adolescents' time allocation patterns to increase their likelihood of attaining higher degrees in education, obtain better jobs and higher future earnings.

This research will respond to the following questions that correspond to each of the chapters presenting the results of the dissertation research (Chapters 6 to 9):

1. What is the effect of the Young Agent Project on schooling outcomes, youth labor decisions and risky behaviors? Do former Young Agent Project beneficiaries have lower grade level delays than non-beneficiaries? And do the effects differ by gender, ethnicity and region?
2. Does transferring cash directly to the adolescent create more efficacy, improving schooling, labor and risky behavior outcomes?
3. Is program dosage, (measured by the number of hours per week allocated to the Young Agent Project after school program), a strong predictor of better outcomes?
4. Is Propensity Score Matching an efficient technique to correct for the selection bias in the case of the YAP program?

### **Contributions of this Dissertation**

This dissertation presents a simple theoretical framework that reflects the dynamics of adolescents' time allocation between labor, schooling, leisure and the consumption of risky behaviors. Unlike most research done about CCTs that consider household utility maximization in child labor frameworks (Skoufias & Parker, 2001; Swartz, 2004), the theoretical framework deals exclusively with adolescent preferences, utility maximization and time allocation decisions with a combined (household and adolescent wage) budget constraint. Under this framework, the adolescent maximizes his utility subject to the consumption of goods, schooling, leisure and status. Status is a crucial variable for understanding adolescents' decisions and it is subject to acceptance among peers and sensation seekers (Gruber, 2001).

The crux of the theoretical model is that adolescents allocate their time in a way that maximizes their utility function by allocating time between studying only, working only, combining work and study or inactivity (idleness). A program such as the YAP is expected to shift the time allocation structure of the youngsters, raising the total amount of time dedicated to school and the After School program combined. The result is that participants, after they complete the program, will have dedicated more time to school, even if combining it with some hours of work. Due to this higher number of hours at school, and the impact of the After School Program itself, it is expected that the program yields greater school grade completion. The empirical research below seeks to determine the impact of the YAP on school attainment. In addition, in the presence of this program, adolescents will be less likely to engage in risky behaviors because the increased time allocation to schooling-related activities –combined with the After-School program focus on leadership and community-- raises the status of school. Education, hard work and *Ser alguém na vida* (To be someone in life), might come to replace violent behaviors, drugs use or teen pregnancy. This dissertation presents the first CCT program evaluation that studies the relationship between time allocation and risky behaviors, such as the use of contraceptives, alcohol, drugs and teen pregnancy among adolescents.

### **Data and Identification Strategy**

As evidence to understand the economics of time allocation among adolescents, this study uses the 2006 *Projeto Agente Jovem* dataset from the *Datauff* of the Federal University of Niteroi, Brazil. Because the YAP was never randomized, the dataset can be considered as F. The dataset is representative of the recipients of the Young Agent Project across income eligibility, regions, states, gender and racial composition, which was administered to 2,210 households. The treatment group is composed of 1,698 former Young Agent Project beneficiaries, and a control group of 512 adolescents. DataUff used statistical controls to

select a comparison group as similar as possible to the treatment group, given crucial socio-demographic characteristics (e.g. income eligibility, age, gender). The surveys were implemented to the control group in the same municipalities and neighborhoods that ex-beneficiaries from the treatment group were being surveyed.

The study performs several analyses using different samples to examine specific effects of the program by gender, ethnicity, region, transfer recipients and after school program dosage. Because the Young Agent Project was not randomized, to correct for this possible selection bias into the program, this dissertation uses Propensity Score Matching techniques, Average Treatment Effect of the Treated, Nearest Neighbor Matching with Replacement (Rosenbaum & Rubin, 1983), is designed to assess program effects in observational studies in the absence of a randomized control group. Finally, this study performs several robustness checks to test the power of Propensity Score Matching Methods to correct for the potential selection bias into the YAP. This robustness check compares the results from the main econometric estimation, a sensitivity analysis applying Propensity Score Matching to different sets of covariates, and a comparison of the treatment effects obtained from a Probit model and Inverse Probability of Treatment Weighting. It concludes that self-selection into the YAP does not affect the causal inferences made in this study.

### **Significance of the Research**

This study goes a step further than previous analyses that see labor and schooling simply as substitutes, looking at the complex relationship between labor and schooling and risky behaviors, placing at the center of the analysis adolescents' utility maximization. If the research concludes that the after school component examined here has a strong positive impact on student enrollment and a negative impact on labor and risky behaviors, the implication is that structured after school programs should become an integral part not only of CCT programs, but also of overall educational policy in developing countries. This is the

first time that the 2006 *Projeto Agente Jovem* dataset is being used for a statistical analysis and thus this will be the first evaluation of this program using causal inference methods.

### **Structure of the Dissertation**

This dissertation is organized as follows: Chapter 2 provides the description of the Young Agent Project in Brazil and an overview of Brazil's poverty and inequalities, education, youth labor and engagement into risky behaviors among the young population. Chapter 3 reviews the rationale and effects of Conditional Cash Transfers (CCTs) and After School Programs (ASPs) on school attainment, dropout rates, child and youth labor and risky behaviors on adolescents. Chapter 4 presents a simple theoretical model about adolescents' decisions between schooling, labor and risky behaviors, as well as the resulting research questions to be investigated using the empirical methods. Chapter 5 explores the data, presents descriptive statistics and explains the methods used to study the impact of the Young Agent Project. Chapter 6, "How the Time is Allocated Matters," investigates the effects of the participation of the program on schooling, labor and risky behaviors. In addition, it provides a grade age delay analysis and discusses the differential effects by gender, ethnic groups and regions. Chapter 7, "Who Receives the Cash Transfer Matters" discusses the differential effects of transferring the cash directly to the adolescent versus to the parents. Chapter 8, "The Amount of Time Allocated in the After School Program Matters," explores the program dosage effects across high, medium and low dosage participants. Chapter 9, "Exploring the Possible Selection Bias," discusses issues of endogeneity and performs several robustness checks. Finally, Chapter 10 concludes by summarizing the dissertation's goals and findings, studies the possible policy implications and proposes a series of policy alternatives.



## CHAPTER 2.

### BACKGROUND OVERVIEW

In recent months, Brazil has become the 6<sup>th</sup> largest economy of the world in terms of Gross Domestic Product (GDP), but is also one of the 10 most unequal countries in the world in income and wealth. Since the 90's a series of welfare programs in the form of Conditional Cash Transfers (CCTs), were created in Brazil in order to help low-income families to increase their investments in health and education. This chapter describes the main features of the CCT program used in this dissertation for the empirical study of the economics of time allocation among adolescents, the Young Agent Project (YAP). The second part shows an overview of Brazil's education system, poverty and inequalities. The Brazilian household surveys (PNAD) made by the Brazilian Institute of Geography and Statistics IBGE<sup>5</sup> are used as the main source for most of these descriptive background statistics.

#### 1. DESCRIPTION OF THE YOUNG AGENT PROJECT PROGRAM

The YAP is a small component of *Bolsa Familia*, a larger Conditional Cash Transfer (CCT) program in Brazil assisting low-income households with children in school from early childhood through high school<sup>6</sup>. The rationale for CCTs is that in very poor households, the burden of schooling causes direct and indirect costs to low income households that can discourage parents from sending their children to school (Parker, Behrman & Todd, 2009) In the case of adolescents, it creates the need to work to support themselves while helping at home. In this sense, CCTs constitute a subsidy to schooling for reducing the shadow price of human capital acquisition (Becker, 1999). A decrease in the direct costs of schooling (tuition

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<sup>5</sup> The PNAD Pesquisa Nacional por Amostra de Domicílios is the Brazilian national household survey done every year by the (*Instituto Brasileiro de Geografia e Estatística* IBGE). The IBGE the federal agency responsible for statistical, geographic, cartographic and environmental information in Brazil. The IBGE performs a national census every ten years, and the questionnaires account for information such as age, household income, literacy, education, occupation and hygiene levels.

<sup>6</sup> *Bolsa Familia* gives a subsidy of R\$70.00 (US \$35) to families conditional on school attendance and in some cases health check-ups and vaccination. Additional amounts are given for children between the ages of 6-15 varying according to the number of children in the family (one child R\$15, two R\$30 or three R\$45 (US\$8 – US\$22). Eligibility is based on household income and the transfer is limited to three children and is given to the mother of the adolescent. The program requires the attendance of at least 85 percent of the monthly school days for school-age children, updated immunization cards for children less than seven years old and regular visits to health care centers for pregnant women.

fees, transportations, books or others) resulting from the CCT has a substitution effect decreasing the amount of time spent working and increasing the amount of time spent in school. The cash transfer is meant to create an income effect (an increase in life-time earnings) increasing consumption of all normal goods, namely of leisure (Parker et al. 2009) More about CCTs will be discussed on Chapter 3.

Unlike most CCTs, the YAP targets only urban adolescents aged 15 to 17, and it is conditional on the attendance of both schooling and a federally provided after-school program attendance. Unlike other CCTs such as *PROGRESA/Oportunidades* in Mexico, the YAP was never randomized<sup>7</sup>. By the time of the *Projeto Agent Jovem* survey in 2006, there were 112,536 beneficiaries between the ages of 15 to 17 (MDS, 2006). The YAP lasts for one to two years between the ages of 15 and 17<sup>8</sup>. The aim of the YAP is to keep adolescents in school, out of work, prevent violent and risky behaviors as well as to make them community leaders in their own *Favelas (Slums)* (Brandão et. al, 2008)

To receive the YAP cash transfer, adolescents must attend school and a federal funded after school program at least 80 percent of the time. Households are eligible for the program fulfilling a maximum income criterion of R\$120 per capita per month (approximately US\$60), but the program targets particularly youth vulnerable to working or dropping out of school. In 2009, the cash transfer was R\$65 (approximately US\$33) per month per adolescent enrolled in the program. Additional funds are sent directly by the federal government to the After School Program in each municipality.

The first special feature of the YAP is that the cash transfer can be received directly by the adolescent, their parents, the legal guardian or the head of the household. The decision

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<sup>7</sup> This has been a general trend for social programs in Brazil since the first CCTs since the early 90's with the governments of Fernando Henrique Cardoso and Lula's.

<sup>8</sup> In some cases, the YAP represents a transition from another federal CCT program called PETI, targeting schooling and child labor for children and adolescents aged 10 to 15. The *Programa de Erradicação do Trabalho Infantil (PETI)*, another CCT initiated in 1996. The objectives were reducing child labor by improving school attendance. The program was focused, however, on those children who actually worked on risk labor activities, and required that these children did not work during the program. Also, children were required to attend to after-school activities (the *Jornada Ampliada*)

to allow the transfer to go to the adolescent could be brought to bear by factors related to the family structure of the household. Information about the treatment group reveals that in 20 percent of the cases, adolescents were living with people other than their parents, including their grandparents, uncles/aunt, sibling and parents-in-law as heads of the households. In addition, in approximately 3 to 4 percent of the cases adolescents are independent from the household. Among that 75 percent that might live with the mother or the father, many might live with step fathers or step mothers. If the cash transfer goes, for example, to a step mother that has other children, she would use that money on her own children instead of the beneficiary. The YAP cash transfer can be given directly to the adolescent, a legal guardian, family member or head of household.

The second special feature of the YAP is the After School Program, called *Jornada Ampliada*. This program is funded, designed and provided by the federal government and delivered by local authorities in the *Favelas* or urban neighborhoods and rural areas with high concentrations of low-income families<sup>9</sup>. The YAP After School Program offers activities that include conferences, sports, arts, theater, cultural trips, health talks, computing skills classes, job training and internship services. Classes and conferences offered at the program include topics of citizenship and human rights, health, drugs, sexuality and environment. Most courses and conferences about citizenship and human rights are designed to engage students in debates about current social issues of poverty, inequalities and discrimination in Brazil. It also provides academic support and other activities such as arts, theaters, sports, and cultural trips as well as links students with other government programs such as the PROUNI<sup>10</sup>. The program also organizes health talks that inform the youth about contraceptive methods and sexually transmitted diseases. Some of the courses, conferences and activities aim to increase

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<sup>9</sup> No information is available about the funding transfer characteristics of the federal government to the After School Program.

<sup>10</sup> The PROUNI is a federal government program that provides scholarships to private universities for low-income students.

educational aspirations, raise self-esteem, and promote leadership and participation of adolescents within their communities (Brandão et al., 2008).

## **2. BACKGROUND OF BRAZIL'S EDUCATION, POVERTY AND INEQUALITIES**

Brazil is a former Portuguese colony (independence 1882), its official language is Portuguese, and is a federation of the union of the Federal District and the 26 States. Brazil is the largest country in South America and is the world's fifth largest country, both by geographical area and by population. It has a population of 196.655 million where urban population constitutes 86.9 percent<sup>11</sup> (IBGE/Census, 2010). Brazil has the 6<sup>th</sup> highest GDP in the world surpassing the United Kingdom in 2011, and had a recent GDP real growth rate of 7.5 percent (IBGE, 2011). Despite this positive panorama, Brazil's GDP per capita is only 10,800 (2010 US dollars), placing it as a middle-income country. In 2011, Brazil was ranked 84<sup>th</sup> on the Human Development Index (HDI) (0.708) and Ranks among the 10 most unequal countries in the World (UNDP, 2011). This section discusses first the basic education system, followed by an overview of poverty and inequalities in Brazil<sup>12</sup>.

### **Brazil's Demographics, Poverty and Inequality**

Poverty and inequalities remain one of the main social problems for Brazil. Despite improvements made in the last decade when its GINI<sup>1</sup> coefficient went down from 60.7 in 1998 to 56.7 in 2005 to 49.5 in 2009, Brazil was placed within the 10 most unequal countries in the world, only a few points below countries such as Haiti, Central African Republic or Sierra Leone. Studies suggest that these reductions of poverty and inequality are due to job creation as well as an artificial income increase as a result of federal sponsored cash transfers (Soares et al., 2007).

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<sup>11</sup> Following national definitions of what constitutes a city or metropolitan area

<sup>12</sup> All tables and graphs for this section are available in Appendix B. this section uses for the most part descriptive statistics from 2006 to 2008, since it refers to the time of the Young Agent Project survey evaluation.

## Map 1

Map of Brazil with States and Great Regions



Source: <http://www.brasilrepublica.com/mapa.htm>. Translation of great regions in order: Northern region, Northeast region, Center-West region, Southeast region, Southern region.

Poverty rates in Brazil remain high despite improvements in the last two decades, going from 41 percent of the population being under the poverty line, to less than 28 percent in 2009 (IBGE/PNAD 2009) (see Graphs B1 to B3, appendix B). Socio economic differences among regions and states are very important. For example, in 2008 the GDP of the Southeast region (1.698.590.000) was three times that of the South, five times that of the Northeast, and more than 10 times that of the Northeast (IBGE/PNAD 2008) (See Map B1 in Appendix B).

To give an example about these differences from the HDI, if we compare Brazilian regions by HDI with other countries, the North northern region would be at the level of Jamaica, the Central West at the level of Russia, the Southern comparable to Malaysia, and the Southeast like Serbia. With regards to the Education Index from the HDI, states from the Southeast such as Rio de Janeiro or Sao Paulo, would be at the level of Switzerland and Slovakia respectively, and states of the Northeast such as Bahia and Pernambuco would be at the level of Indonesia and Nicaragua respectively (UNDP, 2006).

Inequality and poverty tend to hit men and women differently, within rural areas, racial groups, and regions. People of African descent – *Pardos*<sup>13</sup> and black<sup>14</sup> - are overrepresented in the poorer regions, the North and the Northeast (See Map B2). While the total *Afro descendant* population in the Northern region is 73.8 and 70 percent in the Northeast, it is only 40.8 in the Southeast region and 20.3 in the Southern region (See Graph B4, appendix B) (IBGE/PNAD 2009). Furthermore, within the 10 percent of the poorest households in the country, 74.2 percent are *Pardos* or black, only 25.4 percent are whites. Racial inequalities in Brazil are also observed within professions and employment status. While 18.9 percent of *Pardos* and 17.4 percent of blacks worked in informal jobs, only 13 percent of whites were in that category (IBGE/PNAD, 2009). Women are also more likely to

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<sup>13</sup> *Pardos* refer to an ethnic category created in Brazil to describe individuals of mixed ethnicities: white, black and native. The 2010 Census showed that 43.1 percent of the population self identified as *Pardo*.

<sup>14</sup> The 2010 Census estimated that 47.7 percent of the Brazilian population was white, 7.5 percent black, 43.1 *Pardos* (mixed white, black and/or native and black), 1.1 “Yellow” that refers to people of Japanese, Korean or Chinese descent, and 0.4 percent Native Brazilians or Amerindians (IBGE/2010 Census).

have precarious job conditions than males. While in 2009 46.8 percent of men had informal jobs, 51.2 percent of women worked without work permits. Being a woman and of African descent worsens the situation since approximately 68 percent of Afro-descendant women in the northern region have informal jobs (IBGE/PNAD, 2009).

Brazil's youth is also affected by poverty and inequalities. It is estimated that 50.9 percent of its population is between the ages of zero and 29 years (24.1 percent aged 0 to 14, that 17.4 were young aged 15 to 24) (IBGE/PNAD 2009) (See Graph B6, appendix B). The young population is larger in the Northern and Northeast regions and in rural settings. For example, in the Northeast region, 54.7 percent of the population is younger than 29 years, 26.5 percent is aged 0-14 years and 28.2 percent is aged 15 to 29 years old. In the Northern region 60.8 percent of the population is aged 0 to 29 years, 31.3 percent of the population is aged 0 to 14 years and 29.5 are aged 15 to 29 years (IBGE/Censo, 2010).

### **Overview of Brazil's Education System and Educational Background**

Poverty and inequality are also manifested in education attainment, achievement, and access to quality education, creating a cumulative cycle of disadvantages. In Brazil, the schooling system supply is mainly public, which has a lower quality than that of private education at least up to high school (EduData-Brasil, 2012)<sup>15</sup>. In 2007, Brazil invested 4.3 percent of GDP on education. The federal government aims to increase gradually this number to 7 percent (IBGE/PNAD, 2008).

Overall, by 2007, the elementary, middle, and high school system was 79.2 percent public and 20.8 percent private. Paradoxically, in higher education, only 24 percent of the enrollments were in public universities while 76 percent came from private universities (PNAD, 2007)<sup>16</sup>. Public schools across the country offer two to three school schedules of four and a half hours each: 1) In the morning 8am to 12h30pm, 2) in the afternoon 1h30pm -

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<sup>15</sup> See the national center for educational statistics in Brazil, EduData <http://www.edudatabrasil.inep.gov.br/>

<sup>16</sup> Public universities, particularly federal universities are high quality, more selective than privates and free.

6pm and 3) Some schools, mainly high schools offer a schedule at night 6pm to 10pm. Since students must attend only one of the schedules, they can easily combine schooling and work or long hours of unsupervised leisure time. In the meantime, students who attend Brazilian private schools receive on average an eight-hour long instruction per day (EduData Brasil, 2012)

The school year starts in February or March after carnival and finishes late November or early December<sup>17</sup>. For example, in 2011, it started on February 23<sup>rd</sup> and ended on December 22<sup>nd</sup>; thus, classes were given for a total of 194 days. Basic education in Brazil historically has consisted of a first mandatory cycle of eight grades (which in the United States would be primary and middle school) and a second cycle of three grades (high school). Unlike in the United States (with 12 years of schooling), Brazil's system is composed of 11 years from first grade to senior grade of high school. The official entry age to primary school was seven years of age in 2006<sup>18</sup>, and the average age of graduation was 17 years (EduData - Brasil, 2012). Despite the existence of an official school entry age in Brazil, many children do not start school until later, particularly in rural areas, due to poverty and transportation issues.

In recent years, Brazil has achieved great improvements in school attendance and enrollments. Total enrollment rates for the age group of 7 to 14 years (mandatory schooling equivalent) was 97.6 percent (compared to 94 percent in 1999). While the age group of 15 to 17 (the ages of the Young Agent Project) was 85.2 percent (compared to 78.5 percent in 1999). Finally, for ages of 18 to 24 it was 30 percent (PNAD, 2009) (See Graph B8). There are no significant effects among women and men in school enrollment before the age of 15,

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<sup>17</sup> Carnival is the main celebration across all states in Brazil. It also represents an important opportunity for low-income families to make extra money from local and foreign tourists by working during carnival. The date of the Carnival and therefore of the school starting day is calculated every year. Carnival always takes place seven weeks before Easter.

<sup>18</sup> In 2006, the country adopted a legislation extending the length of compulsory schooling by one year and creating a ninth year instead of eight years. Despite this additional year in the first cycle, the official entry age to primary school was lowered from seven to six and the preschool cycle (not mandatory) was shortened to cover ages four through five rather than four through six years. This reform that was implemented only in 2009 does not apply to the study of the effects of the Young Agent Project since the survey was administered in September 2006.



after which the share of females increase in higher enrollment, school completion, and school performance than males (PNAD, 2009). Consequently, the expected years of schooling are one year higher for women (14.5) than for men (13.5 years) (see Graph B7, appendix B). When looking at differences by regions, one can observe that the North and Northeast regions present overall lower enrollments across all age groups, and particularly after the age of 15. While the Southeast region has an enrollment rate of 84.3 percent for the age group of 15 to 17, the North region has 80.1 percent and the Northeast regions 80.8 percent. Interestingly, the North and the Northeast presented higher enrollment rates than the Southeast region for the age groups of 18 to 24, being 32.9 percent in the Northern region, 32 in the Northeast, and 29.8 in the Southeast region, with a national average of 30.9 percent (IBGE/PNAD, 2009) (see Graphs B8 and B9, appendix B). Nevertheless, this is related to grade age delays and not to higher education completion.

Indeed, the median years of education are also lower in the North and Northeast regions. Between the ages of 15 to 17, adolescents in the Southeast and the South already have one year more of education than adolescents in the North and the Northeast. While the median years of education of the age group 15 to 17 in the Northeast are 6.7 and the North is 6.8, it is 7.8 and 8 years in the Southeast and the South respectively. These differences tend to increase for young adults too (See Graph B10, appendix B). By the age of 15 to 17, adolescents should have been in the educational system for 8 to 11 years (IBGE/PNAD, 2009). In 2009, it was estimated, for example, that only 50.9 percent of students between the ages of 15 to 17 were at the grade that corresponded to their age. This percentage is dramatically lower in the Northern and Northeast regions with 39.1 and 39.2 respectively vs. 60.5 in the Southeast region and 57.4 in the Southern region (IBGE/PNAD, 2009).

It is astonishing that in Brazil, from the estimated 82 percent of the age group of 15 to 17 enrolled in school in 2009 (with the age of being in High School), 44 percent were still in

primary or middle school, and only 48 percent were in high school. Furthermore, 42 percent of students aged 18 to 24 were still attending elementary, middle, or high school (IBGE/PNAD, 2009). The analysis suggests that adolescents start falling behind their age group starting in elementary school. For example in 2009, the average number of years of education of a 14-year-old was only 5.8 years.

Despite laws mandating compulsory school attendance, high proportions of adolescents remain out of school or drop out of middle school or high school. In 2007 it was estimated that 10 percent of students in middle and high school dropped out of the school system. Furthermore, the completion rate of middle and high school students in Brazil was only 77 percent, compared to 90 percent in Chile and Paraguay or 91.9 percent in Venezuela (Mercosul Educational, 2007). Studies also suggest that some of this school dropouts and age grade delays among adolescents are explained in part by an early entrance to the labor market or that they are continuously dropping out and coming back into the system (IBGE/PNAD, 2009).

### **Overview of Brazil's Child and Youth Labor**

Laws against child labor in Brazil forbid children younger than 18 years to perform any job. Nevertheless, if authorized by the ministry of labor, it is allowed at the age of 16 or older. Apprenticeship and administrative jobs are allowed for children after the age of 14 as long as they do not harm their health<sup>19</sup>. Although, legally, their jobs and apprenticeships for minors would need to be individually authorized, it is not really enforced.

In 2006, it was estimated that only 56.5 percent of students in high school attended school for more than 4 hours daily (IBGE/PNAD, 2006). The Northern, Northeast and Southern regions presented lower daily hours of school attendance than the national average (IBGE/PNAD, 2009). This short school day follows a long school day afterwards in which

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<sup>19</sup> See Decreto N 3.597, de 12 de Setembro de 2000. [http://www.planalto.gov.br/ccivil\\_03/decreto/D3597.htm](http://www.planalto.gov.br/ccivil_03/decreto/D3597.htm)

children and adolescents can easily accommodate both school and labor. As low-income adolescents grow up, they drop out of school, or in the best of the cases they combine school and labor. In 2008, it was estimated that 10.1 percent of children and the young between the age of 10 and 19 were working (IBGE/PNAD, 2008). Labor increases by age. For example, it was estimated that 1.9 percent of children aged 10 to 14, 3.9 percent of the age group 15 to 17 years and 4.3 percent of 18 and 19-year-olds were working. There are also remarkable differences across regions with the Northeast region having the highest degree of child labor ages 5 to 17 (11.7 percent) and the Southeast the lowest (7.6 percent) (IBGE/PNAD, 2007) (See Graphs B11 and B12, appendix B)

Regarding gender differences overall, females are less represented in child and youth labor than males. Estimates show that while 2.2 percent of males from 10 to 14 years reported being working, only 1.5 percent of females did so. In the age group 15 to 17, labor increased for both, still affecting more boys (4.3 percent) than girls (3.3 percent). Finally, within the age group 18 to 19, 4.5 percent of young men worked, compared to 4 percent of girls (IBGE/PNAD, 2009). Regional differences are also maintained, being that girls in the Northeast are more likely to work than girls in the Southeast (See Graphs B13 to B15, appendix B). Precarious jobs also affect younger women: 69.2 percent of women aged 16 to 24 hold informal precarious jobs without work permits, which does not necessarily include information about domestic work that is more likely to be performed by girls (IBGE/PNAD, 2007).

In Brazil, children, adolescents, and young adults who work do not necessarily stop studying. For example, estimates show that within the age group 18 to 24, 14.7 percent of young adults only studied, 15.6 percent studied and worked at the same time, almost half of them only worked, and 17.8 performed domestic duties. Not only does this trend increase school dropout rates and age grade delays but also future earnings and precarious jobs. For

example, in 2009, 30.4 percent of youth from 16 to 24 declared having worked up to 39 hours, and 43 percent from 40 to 44 hours. Furthermore, 26.5 percent declared having worked more than 45 hours per week, exceeding the legal amount of working hours allowed in Brazil. This early labor experience for marginalized youth could be explained by the relatively high wages adolescents are likely to receive in the labor force. Estimates show that average monthly wages for ages 5-17 were R\$262 in 2007, R\$269 in 2008 and R\$278 (convert figures in dollars for comparison) in 2009 (IBGE/PNAD, 2009), this is already more than the per capita income requirement to be eligible to receive *Bolsa Familia* and the Youth Agent Project. Unemployment has nevertheless increased for the young population. School dropouts and labor participation tend to increase after the age of 14 for both girls and boys, affecting particularly male adolescents in the poorest regions. Children and young adults tend to work and study from a young age. Thus, child or youth labor could be one of the strongest predictors of age grade delays, school dropouts, and long school absences.

### **Overview of Risky Behaviors among Adolescents in Brazil**

Brazilian education has shifted from equalizing access and increasing enrollment rates at lower education levels to equalizing learning and school attainment. As a result, issues such as teen pregnancy, gang and drug involvement, family instability (e.g. unemployment, domestic violence, homelessness), school dropout, and learning issues have become more prominent in recent years (Bruns et al., 2012).

Brazil has one of the highest teen pregnancy rates in the world, with 75.1 per 1,000 adolescent pregnancies on ages 15-19 (UNICEF, 2010). This number is higher than the average of upper-middle income countries (49.3 percent) and also higher than when compared to Latin America and the Caribbean (72.2 percent) (IBGE/PNAD, 2008) (See graph B19, appendix B). Pregnancies of adolescents ages 15 to 19 were represented in 2008 as 23 percent of total births in Brazil. As in the case of schooling and labor, teen pregnancy

affects more adolescents in the poorest regions, the North and the Northeast. Teen pregnancy does not seem to be correlated with early marriage among Brazilian youth. Within the age of 15 to 19 years, only 3.6 percent were married (Graph B18, appendix B) (IBGE/PNAD, 2009).

There are few sources of national data about risky adolescent behaviors<sup>20</sup>. The 2009 survey revealed that 30.5 percent of 9<sup>th</sup> graders in Brazil already had sexual intercourse. This number is significantly higher for boys (43.7 percent) than for girls (18.7 percent) and higher in public schools (33.1 percent) than in private schools (20.8). From those sexually active 9<sup>th</sup> graders, 75.9 percent reported having used contraceptives during the last sexual intercourse and there were not significant differences among gender or public and private schools. (IBGE/PeNSE, 2009)(Graph B17, Appendix B). Regarding sexual education at school, 89.4 percent of 9<sup>th</sup> graders in private schools and 87.5 percent in public schools, reported having received information about sexually transmitted diseases (STDs) at school. Similarly, 81.1 percent of adolescents in 9<sup>th</sup> grade reported having received information on how to prevent early pregnancies. Finally, 65.4 and 71.4 percent of 9<sup>th</sup> graders in private and public schools respectively reported having received information on how to obtain free contraceptives (Table B1, Appendix B). With regard to alcohol, 71.4 percent of 9<sup>th</sup> grades reported having already drunk alcohol and 22.1 percent having been already drunk. Interestingly, these numbers are higher for girls than for boys and among private schools (IBGE/PeNSE, 2009) (Graph B21, Appendix B). Finally, the PeNSE survey revealed that 8.7 percent of 9<sup>th</sup> graders have consumed illicit drugs and that the consumption is almost 4 percent higher for boys (10.6 percent) than for girls (6.9 percent) and among public schools (Graph B22, Appendix B).

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<sup>20</sup> The National Survey of Schooling Health (PeNSE) includes information about 9<sup>th</sup> grade students in public and private schools in all state capitals of Brazil PeNSE (2009) Pesquisa Nacional de Saude Escolar (National Survey of Schooling Health) done in Brazilian state capitals among 9th graders in public and private schools across the country.  
[http://www.ibge.gov.br/home/estatistica/populacao/pense/defaulttab\\_zip.shtm](http://www.ibge.gov.br/home/estatistica/populacao/pense/defaulttab_zip.shtm)

In addition to poverty and lack of opportunities, violence, particularly in the *Favelas*, plays an important role on absenteeism, dropouts and risky behaviors. In Brazil, violence is common in the daily life of many adolescents in Brazil. The PeNSE survey revealed that 9 percent of boys had been in a fight involving knives, and 6 percent in fights involving guns. Because this survey is representative of students across socio-economic status, race, and regions, these percentages of violence and drug use might be significantly higher for adolescents living in the poorest areas and mainly in *Favelas* of urban areas with a high concentration of criminal and drug activities. Indeed, Brazil ranks as the fifth country in the world with the highest homicide rate of young people (15 to 24 years), with 63 homicides per 100,000 inhabitants and 29 deaths per 100,000 inhabitants by young people (WHOSIS, 2008)<sup>21</sup>. Brazil is also the fifth country with the highest young death rate by firearm with 44.2 per each 100,000 inhabitants. Violent deaths, young offenders and victims are higher among men, *Pardos* and blacks, and in the poorest states (and state capitals) of the North and Northeast regions (See Graph B24, appendix B) (Waiselfisz, 2011). It was estimated that in 2008, for each white youth murdered, more than 2 black young adults were murdered (Waiselfisz, 2011). Evidence suggests that the most important risk factors for youth violence in Brazil include substance abuse, having committed offenses such as theft, having antisocial parents, being male, coming from a low family socioeconomic status, having a poor school performance and aggressive behaviors (The World Bank, 2006).

To prevent all these risky behaviors as well as early entrance to the labor market and school dropouts, CCTs are designed to keep children and adolescents in school. Conditional Cash Transfers now centralized in the unique registration with *Bolsa Familia*, make part of those interventions. The next chapter reviews the main literature about CCTs and its effects on education, labor and risky behavior outcomes.

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<sup>21</sup> The definition of Youth used is based on the Pan American Health Organization, and the Health World Organization (HWO) for which ages comprised within “youth” are 15 to 24 years.

## Summary

Despite poverty reductions in the recent decade, with a GINI coefficient of 49.5 in 2009, Brazil is placed among the 10 most unequal countries in the world. Income inequalities and socio economic differences affect particularly, households living in the Northeast or Northern regions, people of African descent or *Pardos*, and to some extent females and the young population. Poverty and inequality are also manifested in lack of access of low-income populations to a quality education, lower retention in secondary education, lower educational attainment and student achievement, and a cumulative cycle of disadvantages. Despite improvements in school access and higher enrollment rates at lower educational levels, differences in school attainment are explained by high dropouts rates among adolescents, absenteeism, and age grade delays associated to an early entrance to the labor market and early pregnancies or violence.

## **CHAPTER 3.**

### **LITERATURE REVIEW**

The purpose of this literature review is to study the rationale and the effects of Conditional Cash Transfers (CCTs) and After School Programs (ASPs), on school attainment, dropout rates, child and youth labor and risky behaviors on adolescents. The first section explores the impact of CCTs and ASPs on schooling outcomes and child labor, focusing on impact evaluations of CCT programs in Latin America. The second section reviews studies about the effect of CCTs and ASPs on schooling and risky behaviors focusing on evidence from both Latin American and American ASPs (See Appendix C for a Comparative Tables of CCTs' Impact Evaluation).

#### **1. SCHOOLING OUTCOMES AND CHILD LABOR: EVIDENCE FROM CCTS IN LATIN AMERICA**

CCTs are programs that aim to reduce poverty and inequalities by transferring money to low-income households or individuals conditional upon the recipients behavior. The government only transfers the money to persons who meet certain income criteria, that must fulfill conditions such as enrolling children into public schools, getting regular check-ups at the doctor's office or receiving vaccinations.

##### **The Economic Rationale for CCTs for Schooling and Child Labor Outcomes**

Economists have long discussed the importance of investments in human capital to eradicate poverty and increase future earnings (Schultz, 1965, Becker, 1960). Human Capital investments take many forms. It can be seen as parental time with their children, the purchase of goods for learning, payments of any school related expenses per direct financial subsidies (e.g. for college). Factors such as the age or the gender of the children, the total household income, borrowing constraints, direct cost of schooling (e.g., transport, tuition fees, and uniforms) and/or the opportunity cost of schooling (e.g. forgone income from child labor)



might thus play an important role on parents' decisions to invest in the human capital of their children. Indeed, empirical evidence suggests that borrowing constraints and other market failures lead to educational underinvestment (Becker, 1960; Schultz, 1961; Friedman, 1962), and it is often a result of the inability of poor families to access credit on equal terms (Udry, 1999; de Mel, McKenzie & Woodruff, 2008). For Loury (1981) parents' inability to borrow or to fund investment in their children's human capital means that inequality of resources in a given generation translates into inequality in the next generation. Under this model, redistribution and social welfare can thus improve economic efficiency (Loury, 1981; Galor & Zeira, 1993, Banerjee & Newman, 1993). This is why, cash transfers with schooling attendance conditionality can be thus thought as an efficient redistribution instrument of investment in education (Parker et al. 2009).

Another crucial point to support redistribution due to market failures is the existence of asymmetries of information affecting low-income families. Indeed, evidence suggests that agents do not always behave exactly as one would expect if they were fully informed. Asymmetries of information about the nature of investments and expected returns to the education of their children might affect the decision making of poor households (Parker et al. 2009). Furthermore, conflict of interest between father's and mother's preferences, are not consistent with the child's preferences or well-being. CCTs conditionality is thus designed to ensure that investments in human capital are constantly done, despite, these possible asymmetries of information and conflict of interests among parents.

Economic theory that supports the need for CCTs also suggests that in very poor households, the burden of schooling causes direct and indirect costs that can discourage parents from sending their children to school (Parker et al. 2009). CCTs can be considered in these cases as a subsidy to schooling for reducing the shadow price of human capital acquisition (Becker, 1999). In a recent article, Parker et al. (2009) explains how for example

a decrease in the direct costs of schooling (tuition fees, transportations, books or others) resulting from the CCT has both substitution and income effects. On the one hand, the substitution effect decreases the amount of time spent in leisure and working at home or in the market as a child and increases the amount of time spent in school. The income effect (an increase in life-time earnings) increases consumption of all normal goods, namely of leisure and consumption in the first and second periods (Parker et al. 2009).

Another economic rationale for CCTs is its role in the case of volatile incomes in risky economic environments such as seasonal harvesting or natural disasters. Studies have shown that cash transfers can smooth household income fluctuations and protect children from dropping out of school or from working. Fields et al. (2007) argue in the case of Latin America that these income fluctuations might affect the demand for schooling with long-term consequences. In some cases these transfers protect children from entering the labor market (Parker et al. 2009). Although few CCTs include the reduction of child labor as an explicit objective, they are unlikely to leave the situation of child labor unaffected. Under-investment in education due to poverty, imperfect credit markets and volatile incomes are also related to child labor. In the 'luxury axiom' theory, Basu & Van (1998) and Basu (1998) suggest that a family will send their children to the labor market only if the family income drops very low. This is consistent with empirical evidence of educational choice in developing countries showing that in low-income households, children largely contribute to household resources during childhood by working some of their time (Jensen & Nielsen, 1997; Ray, 2006, Edmonds & Schady, 2008). Child labor wages also represent a safety net for poor households, an insurance against economic shocks or unstable labor markets (Sparrow, 2007). Particularly rural households, whose incomes can be extremely volatile, obtain informal income insurance by letting their children work, which increases children dropout rates (Guber & Robilliard, 2008).

The economic rationale for CCTs also suggests that there is a substitution effect from schooling and leisure to labor since any time children spent working comes at the expense of time spent studying or in leisure (Ferreira, 2008, Skoufias, 2001). Indeed, evidence from developing countries suggests that poverty and child labor decrease school enrollment (Shafiq, 2007, Ray, 2000, Psacharopoulos, 1997; Hideo & Psacharopolous, 1999) and that this substitution comes also at the expense of earnings and consumption during adulthood (Ferreira, 2008). That is why creating a subsidy in the form of a transfer reduces the income effect of schooling on the household, reduces the opportunity cost of going to school and not working or not sending children to work, while ensuring that the investment is made in human capital. CCTs are thought thus to substitute for children's wages and encourage parents to invest in the education of their children without affecting household income. CCTs create an income effect by reducing the direct costs of schooling, depending on the prior schooling situation of the child (e.g out of school, long periods of absenteeism due to labor) can create a substitution effect by replacing hours of labor with additional hours of schooling. Furthermore, After School Programs are designed to keep children busy during the after school time with structured leisure or academic activities. This mandatory after school time allocation might reduce the amount of hours children can dedicate to work. This might also increase the opportunity cost of schooling for older adolescents in the legal age to work.

### **Evidence of the Effects of Latin American CCTs on Schooling Outcomes and Child or Youth Labor**

CCTs are programs that transfer cash to low income households with the condition that families invest in the human capital of their children by increasing school attendance and in some cases health services (Fiszbein & Schady, 2009). The aim of the transfer is to break the poverty cycle from parents to children by increasing parent's investment in education while reducing the opportunity costs of going to school. CCT programs started after 1997 in

Bangladesh, Brazil, and Mexico with strong improvements in schooling attendance and enrollment outcomes. These programs have spread to more than 24 developing countries including Turkey, Chile, Colombia, Ecuador, Jamaica, Honduras, Panama, South Africa, Nicaragua, Burkina, Faso, Lesotho, Cambodia, Pakistan and even the United States<sup>22</sup> (Fiszbein & Schady, 2009). Mexico's *Oportunidades* currently provides monthly grants for eligible families with children in middle school and high school of approximately 580 pesos (US\$58) for boys and 660 pesos (US\$66) for girls in the third year<sup>23</sup>. Beneficiaries from *Familias en Acción* in Colombia receive a school subsidy of approximately 28.000 pesos (US \$12) for secondary school students. *Bolsa Familia* gives a subsidy of R\$70.00 (US \$35) to families. Additional amounts are given for children between the ages of 6-15 varying according to whether the number of children in the family (one child R\$15, two R\$30 or three R\$45 (US\$8 – US\$22)). Eligibility is based on household income as in the case of Brazil or by using proxy mean testing instruments for measuring poverty such as the SISBEN<sup>24</sup> in Colombia.

Most CCTs have proactive management, monitoring and evaluation systems with differences across countries. Evaluations (and therefore evaluations on schooling outcomes and child labor) have relied on experimental and quasi-experimental designs. *PROGRESA/Oportunidades* in Mexico, Colombia's *Familias en Acción* and the *Bono de Desarrollo Humano* program in Ecuador had randomized treatment and control groups, and in some cases pre and post evaluations (Edmons & Schady; 2009). Other small scale or pilot programs such as Nicaragua's RPS and Atención a Crisis programs, PRAF in Honduras, also

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<sup>22</sup> Recently, a CCT was implemented in New York City. This program is called Opportunity NYC/ Family Rewards. A Randomized impact evaluation is being carried. Its main aim is to improve school achievement.

<sup>23</sup> All these amounts might vary on a yearly basis according to inflation and its value in US according to the currency exchange rate.

<sup>24</sup> SISBEN is a proxy-means testing instrument, known as System for Selecting Beneficiaries of Social Spending (SISBEN, in Spanish). This system is based on assessment of living conditions of individual families. It is measured by the availability and quality of housing and basic public services, possession of durable goods, human capital endowments and current income. For more information see <http://www.sisben.gov.co/Inicio/ConsultadePuntaje.aspx>

used small-scale randomized experiments with credible control groups (Maluccio & Flores, 2005). Studies suggest that Mexico and Colombia have so far the strongest tradition on experimental design evaluation of CCTs with pre and post survey implementations. Initially, *PROGRESA/Oportunidades* was applied randomly to some vulnerable rural communities, and expanded in phases during the first four years of the program and after some years, to urban areas (Parker et. al, 2009) In contrast, Brazil's *Bolsa Familia* (and its predecessor *Bolsa Escola*) is one of the few exceptions in Latin America not to have implemented a randomized program assignment experiment with their CCT program. Some evaluations use descriptive statistics or quasi-experimental designs with Propensity Score Matching Methods (Brandão et al. 2008; Cardoso & Portela Souza, 2004; Yap et. al., 2001)

### **Evidence from Latin American CCTs on Enrollment and Attendance**

Overall CCTs have been found to have a significant and important impact on enrollment rates and school attendance among program beneficiaries. The program *PROGRESA/Oportunidades*<sup>25</sup> in Mexico had perhaps the largest number of impact evaluations suggesting that both children and young in rural and urban communities have positive and significant increases in school enrollments. Using a Difference in Difference (DID) comparison, Schultz (2004), compares school enrollment before and after *PROGRESA/Oportunidades* implementation for the treatment and the control group. He finds a 7 and 9 percentage point increase for girls and a 5 and 6 percentage point increase for boys in the transition from elementary school to junior high. The study also found a one percentage point increase in enrollment at the primary level. This low impact at the primary level might be explained by the already high enrollment rate (over 95 percent) in elementary schools in Mexico (Schultz, 2004). Also analyzing *PROGRESA/Oportunidades* and using a different approach, the Markov schooling transition model, Berhman, Sengupta & Todd

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<sup>25</sup> Created in 1997 PROGRESA, was renamed Oportunidades in 2002.

(2005) looked at the effects of the program on enrollment, dropout and re-entry at each age. They concluded that, unlike the case of enrollment, younger children (6 to 10) experience large reductions in grade repetition and better grade progression. Simulating long run impacts they estimated that by the age of 14, children from the treatment group would have accumulated an additional 0.68 years of schooling. This evidence is consistent with Behrman, Parker & Todd (2005) that analyzed the data five years after the first implementation of *PROGRESA/Oportunidades* in Mexico in 1997. Their results indicate that children with a year and a half more of benefits, achieve 0.2 grades of additional schooling. This effect is not as strong as the one reported by Behrman, Parker & Todd (2005) given that their analysis takes into account the positive impacts of the program on reducing failure and other variables beside enrollment.

Mexico's PROGRESA extended its benefits to the young adult population in 2001, when grants previously ending in 9<sup>th</sup> grade were also awarded for upper secondary school. *Jovenes con Oportunidades* targets youth, and it also includes an additional 13 percent higher transfer for girls<sup>26</sup> as evidence of incentives for them to pursue school. The program opens an account in the last year of secondary school and deposits points equal to Mexican pesos for the subsequent year through the completion of the 12<sup>th</sup> grade. After graduation from high school, students can use that money to attend college, purchase health insurance or get a loan to start a business or apply for housing (The World Bank, 2007). Evidence suggests that in urban areas for example, school dropouts of teenagers between 16 and 19 years old decreased 23 percent. Furthermore, high school enrollment has increased 23 percent in those schools benefiting from the program. After two years of awarding grants at these levels, high school enrollment increased by 85 percent for the first year, in rural areas. On a long term impact analysis, a study concluded that in rural areas, 15 and 19 year old teens that on average had

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<sup>26</sup> For more details about this program see <http://www.oportunidades.gob.mx/JOVENES/jovenes.html>

received the benefits of Youth with Opportunities (*Jóvenes con Oportunidades*) for five and a half years, achieved an additional year of schooling, compared to non-beneficiaries (The World Bank, 2007).

Doing an overview of studies about PROGRESA, Rawlings & Rubio (2005) show nevertheless, that children fulfilling the conditionality are missing too many days of school. Schultz (2000) also indicated that the program had little impact on attendance rate, (measured as days attended per month) because there was already a very high (97 percent) number of days children enrolled in school report attending. Other studies indicate that parents may have an incentive to over report their children's enrollment and attendance in order to get the cash transfer (Duflo & Hanna, 2005). More studies are thus needed to explore this mixed evidence and the possible mechanisms used by parents and students to overcome the attendance and enrollment conditionality.

Mexico's *PROGRESA/Oportunidades* also addresses the issue of gender disparity within a poverty-targeted framework by paying higher cash transfers to female children. Evidence shows a positive increase on enrollments ranging from 3.5 to 5.8 percent for boys and 7.2 to 9.3 percent for girls (Rawlings & Rubio, 2005). The program also increased enrollment for youth entering secondary school by over 20 percent for girls and 10 percent for boys (Skoufias, 2003).

The biggest CCT program is Brazil's *Bolsa Escola* and more recently *Bolsa Familia*. Bourguignon et al., (2003) did an ex ante evaluation of *Bolsa Escola* (CCT prior to *Bolsa Familia*) showing a positive impact of the program in school attendance particularly in the North and Central-West Regions. They suggest that about 60 percent of poor, 10 – 15 years olds, drop out of school, but re-enrolled in school in response to the conditional cash transfer. Another study by Cardoso & Portela Souza (2004) studied the effect of *Bolsa Escola* and

*Bolsa Familia*<sup>27</sup> in Brazil using census data 2000 and constructing a treatment and control group among individuals with the same socio-economic characteristics that did not benefit from the program. This matching design found significant impact on school attendance and enrollments. They showed a 3 percent increase in school attendance of the treated boys and girls with respect to the control group. They suggest that this was a large effect taking into account that only 8 percent of boys and girls were out of school. Although *Bolsa Familia* does not have a special component for gender equity like Mexico, evidence shows that positive impacts on school enrollment and attendance are stronger for girls than for boys (Cardoso & Portela Souza, 2004; De Oliveira et al., 2007). As a result of the program, dropouts also decreased, particularly for girls in the Northern Central region and boys in the Southeastern region. The study also shows that boys' dropout rates in the treatment group seemed to increase in the North and Central regions.

Galasso (2006) did a study of the effects of *Chile Solidario* using Regression Discontinuity methods. The impact evaluation suggests that the program increased attendance approximately 7.5 percentage points and the probability that all children aged 6–14, are enrolled in school. Using Propensity Score Matching and Difference in Difference methods. Attanasio, Fitzsimmons & Gomez, (2005), concluded that thanks to *Familias en Acción* in Colombia, school enrollments of children, ages 8-13, increased by 2 percentage points and by 6 percentage points for ages 14 to 17. As in the case of Brazil, it is important to note that the baseline enrollment in Colombia for both age groups was significantly high (92 percent for ages 8 to 13 and 63 percent for ages 14 to 17) and that improvements with high enrollments are harder to achieve. Interestingly, unlike Mexico, the effect for ages 14 to 17 was large. Unlike Mexico and Brazil, Colombia did not show better effects for girls than for boys,

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<sup>27</sup> Today Bolsa Familia is a unified subsidy program that before was constituted of several different subsidy programs such as Bolsa Escola and Fome Zero.



perhaps explained by the presence of a better gender parity in the enrollments baseline (Barrera-Osorio et al., 2008).

In a study about the effects of *Bono de Desarrollo Humano* (BDH) program in Ecuador, and using randomized and IV methods, Schady & Araujo (2008) suggest that BDH increased by 10 percentage points the school enrollment of children and adolescents from 6 to 17 years of age. They indicated that the largest program effects were found among children in transition from primary to lower-secondary school. This is one of the largest effects of CCTs on enrollment in Latin America (around 13 percent). Interestingly, this amazing effect was achieved despite a larger baseline enrollment rate (of 75 percent) than Chile (60.5 percent) and Honduras (66.4). More so, this effect was achieved despite the fact that the school attendance conditionality was never enforced for receiving the transfer. Indeed, families said that they needed to send their children to school, but in reality no school attendance proof was needed to receive the transfer each month. Schady & Araujo (2006) suggest that in presence of the school attendance conditionality the BDH's impact could have been even stronger. For example, Brauw & Hoddinott (2008), for example, looked at the impact difference in school attendance of those families that received the forms needed to monitor children's school attendance vs. those that did not. They concluded that enforcing the schooling conditionality is a key component for the efficiency of the CCT program.

Maluccio & Flores (2005) performed a randomized evaluation of the pilot phase of the Nicaraguan, *Red de Protección Social* (RPS). With a baseline enrollment of 72 percent for ages 7 to 15, the RPS had a positive and significant impact increasing school enrollment by 13 percent and school attendance by 20 percent. Marcours & Vakis (2008) evaluated also with randomized methods the other Nicaraguan CCT, *Atención Crisis*. The effects on ages 13 to 15 (with an enrollment of 90 percent) were 7 percent. This difference can be explained by

the fact that it tends to be harder to improve enrollment of older adolescents (ages 14 -15), and that prior to the intervention this group had already a very high baseline enrollment.

Honduras, with the lowest baseline enrollment for children ages 6 -13, (66 percent) had the lowest effect. Glewwe & Olinto (2004) performed a randomized evaluation of the *Programa de Asignación Familiar* (PRAF). They found that the program increased enrollment by only 3 percentage points for this age group. The program also increased school attendance (conditional on enrollment) by about 0.8 days per month and increased annual promotion rates to the next grade by 2-4 percentage points. The effect was stronger on poorer households.

### **Evidence from Child and Youth Labor in Latin American CCTs**

Few CCTs in Latin America target specifically child labor. Despite this fact, it could be expected that creating a subsidy conditional to schooling attendance, the income effect of schooling on the household, reduces the opportunity cost of going to school (and not working), all while ensuring the investment is done in human capital. With a long term experimental evaluation of *PROGRESA/Oportunidades* using difference-in-difference, Berhman, Parker & Todd (2007) concluded that boys aged 15 to 16 years (9-10 pre-program) had a reduction of almost 30 percent in the probability of working. This effect is consistent with the theoretical assumptions that the young still attending school are likely to postpone their entry into the labor market. Interestingly, the study of (Berhman, Parker & Todd, 2007) also concluded that girls aged 13 to 15 years of age, pre-program (19-21 post program), showed a 6 percentage points increase labor. The authors of this study suggest as an explanation that perhaps older girls substitute in the labor market for their younger siblings, who do show increases in their schooling and work (mainly in the case of boys). Note that this effect could be magnified by the impact of domestic labor within gender bias (affecting more girls). This is done in another study about Mexico by Skoufias & Parker (2001) that

used Double Difference in Difference to study the schooling, work and time use decisions of beneficiary children in the early years of the program. Unlike the previous study, they looked at the effects of the program on different types of jobs: market jobs, rural jobs and domestic jobs. Both boys and girls showed reduction in all three types of jobs, particularly on domestic work with a reduction between 5 and 10 percent. Girls aged 14 to 15 showed reductions of between 2.6 and 3.9 percentage points.

These effects are consistent with evidence from other CCTs in the region. In their evaluation of the Nicaraguan (RPS), Maluccio & Flores (2005) show that the program reduced the percentage of working children aged 7 to 13 by 5.6 percent and that impacts were larger for extremely poor households. This study shows nevertheless contrasting evidence for gender differences in hours worked after the program. While boys reported working at least 25 hours a week, girls reported 16 hours per week. The authors explained that because the questionnaire was focused on economically oriented activities, results could be different for girls that tend to work more in domestic activities.

In a recent study about Ecuador, Edmons & Schady (2009) showed that children benefiting from *Bono de Desarrollo Humano* in Ecuador had a 41 percent reduction in child labor. This measure is, nevertheless, only for those that “work for pay” and therefore does not include domestic labor or other kinds of non-remunerated jobs that children might do informally with their parents. The authors also suggested that there was a negligible effect of the BDH on “work for pay” within the population that is already out of school or in paid employment. This indicates that the impact of child labor is on reductions of hours worked of children already studying.

Evidence from Brazil indicates that *Bolsa Escola* did not have such a positive effect on child labor. Using a micro-household level data from the 2000 Census and propensity score methods, Cardoso & Portela Souza (2004), estimated the impact of income transfers on

child labor and school attendance. They found that the income transfer from *Bolsa Escola* had no significant effect on child labor reduction. As seen before, this program did however have a positive and significant impact on school attendance and school enrollment by 3 percent for girls and by 4 percent for boys. For the authors, this evidence suggests that the transfers are too small to provide an incentive to forgo the labor income. Furthermore, this might be explained by the fact that in Brazilian public schools the school day is too short and that it is easy to accommodate both schooling and labor. More so, they suggest that the subsidy is too small to make children stop working in the after school hours.

The opportunity cost gets stronger as age increases, since in Brazil, children can obtain their work permit by the age of 14 (*Carteira Assinada*) and can have earnings higher than the amount of the cash transfer. Unlike evidence from Mexico, strong gains in enrollments with no effects on child labor could also indicate that school and labor are not a substitute, but rather, complements. Other programs in Brazil target specifically child labor eradication, for example, the Child Labor Eradication Program, PETI<sup>28</sup> (*Programa de Erradicacao do Trabalho Infantil*). PETI was first implemented in rural states in the North East in 1996 then unified with *Bolsa Familia*. The program was similar to *Bolsa Escola* in that it tied a transfer payment to school attendance of children aged 7-14. In PETI, a child would attend school at least 80% of the time. The innovative feature of this program is that in addition to the conditionality of school enrollment and attendance, children must attend an after school program called *Jornada Ampliada* (Tabatabai, 2006, Brandão et al., 2008). This program doubled the length of the school day, thus, eliminating the need for an afterschool program. Furthermore, a result of the school day extension results in increased attendance and fulfillment of attendance requirements. The ASP offers activities that include cultural, arts, sports, homework support and other recreational activities. Using an experimental

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<sup>28</sup> By the time of the evaluation in 2001, qualified households must have per capita income below one-half the minimum wage (R\$65/month which is roughly equal to \$65/month in U.S. dollars. Households received between \$25 R and \$ 100 R per child.

design collected in treatment and control municipalities, Yap et al (2001) found that the probability of working among the participating children aged 7-14 decreased from 17 percent to 10-13 percent in Pernambuco, from 17 percent to 4 percent in Sergipe, and, dramatically, from 38 percent to 12 percent in Bahia (the state with the highest child labor force participation rate in Brazil). PETI also increased academic performance and rose the average time in school from 11 to 17 hours per week. The authors suggest, nevertheless, that child labor force participation may not be a problem if the child is working relatively few hours. The magnitude of the reductions becomes smaller than the impact on labor force participation for children working at least 10 hours per week. They suggest that children were more likely to participate if they were already working fewer than 10 hours per week. Tabatabai (2006) indicates that these effects are stronger than those from Mexico's *PROGRESA/Oportunidades*, which showed a reduction of child labor for these age groups from 2 to 20 percent. Yap et al. (2008) suggest that the magnitude of PETI's impact on school attendance suggests that all the increase in time spent in school is due to the *Jornada Ampliada*. Regarding gender differences, evidence from PETI is consistent with effects from Mexico and Brazil's *Bolsa Escola*. Another study about the PETI, by the World Bank (2001) concludes that the program has less effect on girls performing domestic work (The World Bank, 2001).

### **Some Critiques of CCTs Programs and Evaluations**

Despite the overall positive impact on schooling outcomes and child labor, many studies have criticized CCTs' evaluations and programs. In terms of methodology, the ideal design for making causal inferences is the experimental design using randomized assignment of the control and the treatment groups. Parker et al., (2009) suggests, nevertheless, that only Mexico, Colombia and Chile have serious and credible and well-randomized experimental designs with pre and post evaluations. Impact evaluations for *Bolsa Escola* and *Bolsa*

*Familia* (that did not engage in randomized assignments) have been criticized for not constructing credible control groups. Indeed, in Brazil, any qualifying household from any region fulfilling the per capita income conditionality can benefit from the program. This implies that the treatment groups might present selection bias due to the fact that families apply to the program are more motivated, have more access to information. In addition, randomized experiments have been said to be unethical. In Mexico, when the results of the initial evaluation of *PROGRESA/Oportunidades* were made public in 2000, a number of Mexico City newspapers ran articles criticizing the “unethical” nature of the evaluation excluding families from anti-poverty programs (Parker et al., 2009).

Perhaps one of the biggest critiques of CCT programs is that other than mandatory school attendance that is translated into lower dropouts and increased education attainment, little has been done about school quality (Reimers et al. 2006). Reimers et al. (2006) argues that due to the lack of improvements on education quality, CCTs do not provide real future educational and job opportunities to children and therefore, do not necessarily alleviate the great long run goal of CCTs: to reduce the intergenerational transmission of poverty. Several studies suggest that it is the quality of the education supply and not only enrollment that increases learning outcomes (Vermeersch & Kremer, 2004). The lack of impact on test scores even among children who have received more schooling thanks to the CCTs is found by, Ponce and Bedi (2008) for Ecuador BDH, Behrman, Sengupta, and Todd (2000), Behrman, Parker, and Todd (2005) for Mexico’s *PROGRESA/Oportunidades*. Also Behrman, Parker, and Todd (2005) show how in Mexico, *PROGRESA/Oportunidades*, a stronger positive impact occurred within enrollment on children that attended general or technical schools, than on those that attended the long distance, satellite-based *Telesecundaria* schools. They explained that quality perception might affect parent’s decisions on whether to send or not to send their children to school. Increasing enrollments without improving schools’

infrastructures, supplying additional and better qualified teachers or providing more resources to schools, might affect educational achievement, public college admissions, increased jobs opportunities and increased salaries (Reimers et al., 2006; Schwartzman, 2006; Behrman, Parker & Todd, 2007; Parker et al, 2009). Honduras and Mexico have established complementary services targeting CCT communities or national coverage school construction and transfer payments for parents and teachers associations, but this is not the norm of CCT programs (Levy & Rodríguez, 2004; González-Pier et al., 2006). Reimers et al. (2006) explains that it might be easier for governments and politicians to subsidize the demand for education than to start with deep educational reform that can occur with political costs.

Other critiques focus on the efficiency of reaching targeted populations effectively at a low cost. Although most studies for Latin American CCTs conclude that programs have reached the poorest populations (Soares et al., 2007; Coady et al., 2003), empirical evidence also suggests the opposite. Using the Brazilian National Household Survey of 2003, Schwartzman (2006) found that *Bolsa Escola* had a bias against the poor in urban areas, certain regional distortions and did not manage to include the large portion of the poorest households. For example, in 2003, the number of non-participant households in the lowest income deciles is larger than those in the 4th or 5th deciles. Of the 8.3 million children and families receiving the cash transfers, 1.5 million or 17 percent, were in the upper 50 percent income bracket. Schwartzman (2006) suggests, thus, that this subsidy might be reaching families that would keep their children in school anyway, and not children within the lowest quintiles, more affected by dropouts, child labor and lower incomes. Another possible explanation is that the lowest income families lack information about financial literacy skills to benefit from the program.

Exclusion of the most vulnerable can also be a fault of the program design (Armas Davila, 2004). Ecuador's program BDH, for example, delivers transfers through its network

of private banks localized in the main cities. Distance to the main cities excludes many possible beneficiaries or makes mothers travel considerable distances from the rural areas to cities just to receive the subsidy. This is also the case of Colombia's, *Familias en Accion*, where the lack of access to banks in rural areas, far away from the cities, excludes about 12 percent of the eligible population (Nunez & Cuesta, 2006).

Regarding child labor, some studies suggest that cash transfers are too small to create a real incentive to forgo the child's income. In Brazil, for example, 17 percent of households in rural areas with children aged 5 to 14, received child earnings that represented more than 40 percent of the family income (Kassouf, 2001). This share tends to increase for the age group 15 to 18, since in Brazil adolescents can obtain their work permits by the age of 14. These results are also consistent with evidence from Bolivia and Venezuela that show that by the age of 13 a child could be contributing as much as 10 to 15 percent of the total household income. This pattern gets even stronger between the ages of 15 and 18 where their earnings may rise to 30 percent of the total household income (Psacharopoulos, 1997). For both countries, the average total income of households with children working is higher than those without children working. The study also suggests that grade repetition and lower education attainment are associated with child labor and that, while not all working children abandon school, child labor delays their high school completion year (Psacharopoulos, 1997). Child wages are an important component of family household, and the opportunity cost of attending school and to stop working is particularly strong for the poorest households and for older adolescents. As seen in some of the evaluations, increasing enrollment and attendance with no effect on child labor might imply that children reduce their leisure time to accommodate going to school without reducing hours worked. In the meantime, if school and work are complementary (as the evidence from Brazil suggests) and not substitutes (as the evidence of Mexico, Nicaragua and Ecuador shows), implementing programs such as PETI or YAP with



an after school program might affect school attendance, attainment and increase dropout rates. Further evidence needs to be done about this matter.

Another critique is the lack of evidence CCTs' impact evaluations about age grade delays present in the young, low-income population. Research, on grade retention, suggests that an age grade delay is often associated with grade retention, absenteeism, school dropouts and child or youth labor. With evidence from the United States, Hauser et al. (2004) show, for example, that at least 15 percent of pupils are retained between ages 6 to 8 and 15 to 17. Research has also established that gender differences might also be accountable for some of the age grade retardation. Males are, for example, far more likely to be retained than females (Dawson, 1998). Furthermore, age grade retardation affects predominantly racial minorities such as Hispanic and African American, particularly for adolescents ages 15 to 17 (Heubert & Hauser, 1999). Overall, high retention rates in males or minorities, is associated with disadvantaged socio economic backgrounds of the family, as well as of course with negative student outcomes in school.

In developing countries, repetition is high particularly among children and the young living in rural or isolated areas or dropping out of school to work (Schiefelbein & Wolff, 1992). Evidence from indigenous or rural children in Mexico shows that they are more likely to be age-grade delayed because of language problems, school access or distance (Patrinos & Psacharopoulos, 1996). This study also suggests that as the number of siblings in the household increases, late school entrance and school dropouts also increase due to the increasing dependence of child labor or because older children, particularly girls, might have to help their mothers take care of the younger ones. High levels of repetition, absenteeism or school dropouts can also be a result of child labor. Families who own small businesses in the informal market sector are also more likely to have their children working (Rossi & Rosati, 2003). Studies have also accounted for the interdependence of working and studying, which

when taken simultaneously, can increase the likelihood of age grade delays at school (Beegle et al., 2006).

## **2. ADOLESCENTS AND RISKY BEHAVIORS: EVIDENCE FROM CCTS IN LATIN AMERICA AND AFTER SCHOOL PROGRAMS IN THE UNITED STATES**

Adolescence is a crucial age, when identity is shaped, when many marginalized youth get lost due to a lack of opportunities or the development of risky behaviors. Adolescents from deprived neighborhoods, facing poverty, low quality schools with a more demanding and competitive job market, and lack of opportunities are highly exposed to gangs and violent behavior in the streets of their own communities. Some adolescents drop out of school, start working early, become pregnant, get involved with drugs (using or dealing), or simply stop dreaming about the future. Evidence suggests that greater educational attainment and higher student achievement reduces the probability of sliding into risky behaviors, and becoming pregnant at an early age (Buvinic, 1998; Lopez, 2003; Catalano et al., 1999; Dynarsky & Burdumy, 2007; Eccles & Templeton, 2001; Fashola, 1998). That is why investments in youth, particularly in education and risky behavior prevention, have been showing to have great economic and social returns in developing countries (Knowles & Behrman, 2003).

The second part of the literature review starts with the conceptual framework used in the fields of developmental psychology, economics and behavioral economics for understanding risk behaviors in adolescents. Then, it presents impact evaluations of CCTs and ASPs made in the United States and Latin America, particularly in Mexico on the effects on reducing risky behaviors among adolescents.

### **The Economic Rationale of After School Programs and Risky Behaviors**

Traditionally, risky behaviors have been a biomedical term to relate to adverse outcomes related to morbidity and mortality. These are conditions of human behaviors that increase the probability of compromising or affecting the quality of life, the health and the

life itself of individuals. Risky behaviors include activities such as drinking, drinking and driving, smoking, consuming drugs, having unprotected sexual intercourse, committing crimes, teen pregnancy, and dropping out of school (Gruber, 2001). These behaviors have important economic consequences for adolescents since they not only affect their wellbeing and their health but also their life prospects, their educational attainment, achievement and future earnings (Gruber, 2001; Buvnik, 1998). Furthermore, some risky behaviors might have negative externalities. Crime, alcohol and drug use, can lead to crime, automobile accidents or dependence on the welfare (O'Donoghue & Rabin, 2001). Teen pregnancy among low-income girls might also create a burden on welfare, affect girls' future educational attainment and earnings and affect the lives of the children born into poverty from young inexperienced mothers.

### **Traditional Economics and Adolescents' Risky Behaviors**

Under this approach, decisions over risky activities are expected to arise from utility maximization seeking, with exponential and time-consistent preferences. Under this framework, adolescents face some risky choices with dubious benefits such as pleasure or social status, and potential costs such as getting arrested in the case of crime or dropping out of school in the case of teen pregnancies (Gruber, 2001). In a study, Becker and Murphy (1988) suggested that these costs could be monetary (e.g. lower future earnings, time spent in prison), symbolic (e.g. lower social status among peers) or physical (e.g. health issues as a result of drug consumption). Benefits can also be monetary (earnings from drug selling) or symbolic (status, belonging to a gang, a community). Under the utility maximization model, if the perceived benefits exceed the costs, adolescents will pursue the risky activity. Adolescents face a decision making process of the costs of the activity today versus the long run, negative or positive implications of pursuing risky activities (Gruber, 2001). Because

both benefits and costs are probabilistic, the benefits of the immediate sensation may be better known than the costs.

Another important topic linking youth and risky behaviors is that, more than anyone, adolescents are sensitive to change in prices. Adolescents do not have high incomes or are dependent on their parents, so changes in prices strongly affect their decision making on drugs, cigarettes and alcohol consumption. Evidence from a longitudinal study about adolescent consumption of risky products suggested that as the real price of marijuana, cocaine, cigarettes and alcohol falls, consumption strongly increases (Grossman, 2004).

These models have been criticized due to their simplistic assumptions explaining complex adolescents' decision-making and behavior patterns. For example, O'Donoghue & Rabin (2001) found two important problems with this simple standard model of exponentially discounted utility for adolescents' decision making. They suggest that youth preferences are time inconsistent, and that decisions and preferences are strongly mediated by peer effects, present preferences, and future projection bias. This will constitute the base for the behavioral economics approach, bringing also elements of developmental psychology into their models.

### **Developmental Psychology and Adolescents' Risky Behaviors**

Developmental psychologists provide a complex framework with a wider variety of factors mediating youth decisions to take risks. Fishoff (1992) suggests for example that risky behaviors are determined mainly by two factors: 1) cognitive development that includes capacity for thinking through problems; knowledge of alternatives and their implications, values and skill in carrying out analyses of the alternative; and 2) social development, or the role of peer effects and the incorporation of social attitudes. Contrary to traditional economists, they show evidence that this decision-making is time invariant and non-time constant, meaning that adolescents have different patterns of decision making than adults. A

study made by Halpern-Felsher & Cauffman (2001) found that adults generally outperformed youth on measures of decision-making competence, such as considering all options, risks, and long-term consequences. Furthermore, adolescents value more the present than the future, and do not look at the future implications of today's actions. This trend can be stronger in low socio-economic status youth, for whom future opportunities (to study, to get good jobs and high earnings in the future) might not seem like a possible option. Studies explain that lower socio-economic groups seem to have a considerably higher time preference rate generally than higher socio-economic groups. This means that they discount heavily future benefits relative to the value of immediate gratification, a major challenge for engaging them in preventative programs (Frederick et al, 2002).

To Portes & Rumbaut (2001), educational expectations are influenced by the availability of real opportunities for increased schooling, such as scholarships, loans and affirmative action programs. We observe in them a vicious cycle: youth that value more the present than the future, that do not have real opportunities anyway, and that stop dreaming and engage in risky activities that will indeed harm their future. Appadurai (2004) and Ray (2006) for example discuss the close association between poverty and aspirations for the future. They suggest that low socio-economic households do not have the economic and social experiences that would help them realize that escaping from poverty is a feasible option. That is participation in programs such as CCTs and ASPs, learning about the positive experiences of others through social interactions, and the strengthening of links between poor communities and the rest of the economy can be crucial for changing and shaping aspirations (Appadurai, 2004).

Studies on developmental psychology also suggest that adolescents' valuing of social relational goals tend to have very strong effects on their decision-making competency. According to Steinberg & Cauffman (1996) this high susceptibility to peer effects increases

between childhood and early adolescence, peaking sometime around age fourteen, and declining after the high school years. While adolescents are heavily influenced by their peers and by social interactions, adults are more self-reliant in their decision-making. Wilson (1987) found for example evidence of reduced crime for marginalized adolescents from inner cities thanks to a program encouraging the willingness of other adults in the neighborhood to discipline youth, act as positive role models, and limit the amounts of unsupervised youth activity. This mixed evidence indicates that adolescents can either make good decisions (e.g. advice from teachers) or experience disruptive factors that make it difficult to make good decisions (e.g. impulsivity, negative peer effects or lack of opportunities in education).

### **Behavioral economics and adolescents' risky behaviors**

Behavioral economics improved the traditional economic models by adding some of the alternatives to decision-making suggested by development psychologists. For them, although the shortcomings of the rational-choice model are relevant for people of all ages, they seem particularly problematic for adolescents. O'Donoghue & Rabin (2001) for example, suggest that one of the problems with the simple standard model of the exponentially discounted utility of adolescents' decision making, is that in reality preferences are time inconsistent. For them, adolescents do not use a constant discounted rate in considering decisions in the short run nor in the long run. In the case of adolescents particularly, the discount rate tends to be higher in the short run than in the long run (Gruber & Koszegi, 2000). Furthermore, youth and adults might value consequences of their acts differently due to other factors. Studies suggest for example that youth tend to score higher than adults on sensation-seeking and risk-taking behaviors (Zuckerman, Eysenck, & Eysenck 1978; Arnett 1994). This suggests that adolescents might have a positive marginal instantaneous utility from engaging on risky behaviors since it satisfies immediate needs (O'Donoghue & Rabin, 2001). This utility could come from status, strong sensation seeking

(e.g. drugs use) and acceptance among peers. Researchers in behavioral economics have also studied the question of whether adolescents are future oriented. Putting together an experiment of peer-simulated counseling sessions among 7, 8 and 12<sup>th</sup> graders, Lewis (1981) concludes that there is a significant increase with grade level in the mention of the potential risks and future consequences of decisions. Positive peer-group interactions have also been shown to be important predictors of criminal activity (Case & Katz, 1991; Levitt & Lochner, 2001).

Behavioral economists also introduced the notion of projection bias. This means that adolescents may inappropriately project the current moment's preferences onto their future tastes. The underestimation of the value later in life might be at the origin of risky behaviors such as dropping out of school, selling drugs or having a child during adolescence; for example if today jobs are unappealing, tomorrow they will be unappealing too (O'Donoghue & Rabin, 2001). Other evidence suggests that youth are in some ways overly pessimistic about their future. With a survey among 16 and 17 years olds about personal probabilities of dying young, Fischhoff et al. (2000) found that 18.6 percent of respondents thought it was likely that they would die in the next year. This evidence is consistent for example with the number of deaths and victimization among adolescents in marginalized and violent areas (e.g. *Favelas* in Brazil or in poor minority communities in urban areas in the United States) where the lack of future opportunities is combined with the 'normalization' of deaths within the community.

Economic gains might also be at the origin of certain behaviors such as crime and drug trafficking. Robbery and property crime might have good returns to adolescents with lower risks of being incarcerated. Adults, instead have a higher risk return since they face longer sentences in prison (Levitt & Lochner, 2001). This can be explained also by the fact that in most countries, under 18 youth are considered children and are not held responsible for

crimes as adults. The study also suggests that while returns to gang-related drug distribution are higher than for robbery, its physical risks are higher than any other type of crime (Kennedy, Piehl, & Braga, 1996; O'Donoghue & Rabin, 2001).

CCTs and ASPs for marginalized youth could be useful instruments to prevent crime and other risky behaviors that are associated with crime like drug use and traffic. Indeed, impact evaluations have shown that in addition to the schooling component, After School Programs in the US are providing a space to create positive peer effects and changes in socialization patterns among adolescents (Lopez, 2003). Furthermore, results have shown significant effects of after school programs in improving youth self-confidence and self-esteem, and reinforcing positive attitudes toward school (Durlak & Weissberg, 2007).

### **Evidence of the Effects of CCTs on Risky Behaviors in Latin America**

As seen before, scientific literature on risky behaviors, such as alcohol consumption, smoking and having unprotected sex, suggest that increases in education results in the reduction of certain risky behaviors. With the subsidy, it is expected that young women would be able to buy contraceptives more frequently, and with the health-related component included in most programs, women would have more information about sexual behavior and contraceptive methods. Furthermore, if the program affects schooling, greater educational attainment might increase the girls' educational aspirations and postpone the age of marriage and/or first pregnancy

The design of PROGRESA *Oportunidades* in Mexico was only minimally oriented towards the health of adolescents. Regarding alcohol consumption and smoking, the results in a longitudinal study using experimental methods (Gutierrez et al., 2005) demonstrated that after nearly 6 years of program participation in rural areas, there was a 15 percentage point reduction in both alcohol and cigarette use for those aged 15–21, compared with control groups. Some impact evaluations have been carried out on the effects of *Oportunidades* on



risky sexual behaviors and teen pregnancies. (Gutiérrez, 2007). Gutierrez et al., (2005) performed a long-term evaluation of the impact of PROGRESA. After nearly 6 years, there was a positive impact in the reduction of sexual partners but no impact on the age of first sexual experience or on the probability of using contraceptives or condoms. Only in Mexican rural areas, *Oportunidades* tends to delay the age of the first sexual experience in girls. More importantly, the program did not show a significant impact on teen pregnancies (Gutierrez, 2007). Similarly, Galarraga and Gertler (2009) found that the program reduced the expectations of female adolescent marriage and teen pregnancy. They suggest that this result is consistent with increased condom use when engaging in intercourse for the first time.

This evidence is consistent with other studies of the use of contraceptives among young women from *Oportunidades* between 1997 and 2000. While the program increased the prevalence of contraceptive methods by 5 to 10 percent among women 20 to 24 years of age, it did not have a significant impact on contraceptive method use among adolescent beneficiaries aged 15 to 19. The effect was stronger for young women within the lowest socio economic level (Lamadrid-Figueroa et al., 2008; Hernández-Prado et al., 2005; Gutierrez et al., 2005). The authors also found that this can be the result of the conditional attendance to health seminars, and the overall improvement in access to contraceptive methods in the communities receiving the treatment. With the subsidy provided by the program, young women would be able to buy contraceptives more frequently and with health talks provided by the program, women would acquire the necessary information about contraceptive methods. Hernández-Prado et al., (2005) did not find a significant impact on the reductions of pregnancies. Indeed, they found that at the time of the follow-up survey, 10 to 15 percent of female teen beneficiaries were pregnant (Gutierrez et al., 2005; Hernández-Prado et al., 2005). The authors indicated that this percentage is larger than the average population (7 percent). Interestingly, Gutierrez et al., (2005) also found that there was a 10 percent

improvement in aspirations to finish high school with regards to the baseline survey. This suggests that better expectations for the future do not necessarily change irresponsible sexual behavior that causes teen pregnancies and sexually transmitted diseases (Gutierrez et al., 2005). Theories have suggested that not only education attainment and educational aspirations are crucial to lower teen pregnancy rates. Barber, 2001, suggests also that the perceived social norms that support or normalize teen pregnancies within the community, attitudes towards contraception methods are crucial to understand teen pregnancy.

### **Evidence of the Effects of After School Programs in the United States on Risky Behaviors**

ASPs targeting adolescents at risk (and their evaluations) tend to focus on three types of outcomes: academic, prevention of risky behaviors and youth development. They use a wide range of evaluation design methods: experimental, quasi-experimental, and non-experimental. This review will focus only on evaluations of ASPs with academic and risky behavior prevention goals using experimental or quasi-experimental research design in the United States. Although there is an explosion of ASPs in Brazil for at risk youth, for the moment, no experimental or quasi-experimental evaluations have been done for those programs.

One of the largest and most studied ASPs in the US is the 21st Century Community Learning Centers (21st CCLC). This program provides expanded learning opportunities for participating children in a safe, drug-free, and supervised environment. Mathematica Policy Research performed a nation-wide evaluation that included a quasi-experimental middle school study and a random assignment experimental elementary school study. The U.S. Department of Education (2003) performed a quasi-experimental evaluation design for the middle school study (using propensity score matching techniques) and a random assignment experimental elementary school study. Evidence from this nationwide evaluation indicates

that middle school participants exhibited a statistically significant improvement in school attendance compared to comparison group members (9 days absent during the 2000–2001 school year vs. 10.1 days absent for comparison students). Interestingly, middle school participants in ASP were more likely to report that they sold drugs (3.3 percent of participants vs. 1.8 percent of comparison group students) and smoked marijuana (3.7 percent of participants vs. 2.7 percent of comparison group students) (Moore et al., 2000; U.S. Department of Education, 2003).

These negative effects might be a result of both the type of evaluation and the programs themselves. It is important to take into account that this is a nationwide evaluation and that ASPs vary enormously in terms of quality, its beneficiaries and their communities. In addition, while some programs might recruit low-income adolescents without major behavioral or academic problems, some might focus only on students at risk of school failure. Different findings of positive effects and effect size might then also depend on the population studied (Lauer et al., 2006; Miller, 2003). Indeed, other studies of 21st CCLC, evaluating individual programs at the local level or for specific populations have shown positive impacts. Using experimental methods, Carter et al. (2006), evaluated the effect of the ASP Project Venture on substance abuse prevention with American Indian youth. Results indicated significantly less growth in substance use amounts in treated youth measured by the four outcome parameters (alcohol use, cigarette use, marijuana use, and combined substance use) taken together. Nevertheless, the study did not find any significant results on drug and cigarette usage over time.

This positive evidence is consistent with another study about the long-term effects of ASPs on educational adjustment and juvenile crime from the LA's BEST ASP. Huang and Chinen (2007) found that program participation, especially for those intensely engaged in the program, improved academic achievement and lowered engagement in crime. Furthermore,

short-term benefits of after-school participation by middle school youth were maintained into their transition to high school. In a recent study, Roth et al., (2010) reviewed a large number of ASPs that target adolescents across the US. They found that greater ASP attendance was often associated with large improvements in academic achievement and improvements of some behavioral outcomes. Indeed, the evaluation literature on ASPs has largely explained these differences as an effect of what they call “dosage” that refers to program attendance or to the amount of program participation.

Evidence suggests that only students with high dosage on the after school programs improved more than their matches. Some studies not only performed analysis between control and treatment groups but also followed the treatment group with regard to an individual’s attendance. This is the case of the Maryland After School Community Grant Program evaluation that used experimental and quasi-experimental design methods. Weisman et al. (2001) show that while program participation was not significantly associated with delinquency and drug use, adolescents that attended more programs had self-reported reduced delinquency and drug use. Another example is a study that found that in the After School Learning and Safe Neighborhood Partnerships Program in California, high-dosage students improved more in their school attendance than low-dosage students (Prenovost, 2001). Welsh et al. (2002) also found larger effects on prevention of risky behaviors for students that were highly active in the program (measures with an attendance of 60 days per year) for a year vs. those highly active for two years. It is also important to take into consideration the type of student concerned in the program when making comparisons.

Smith and Zhang (2001) performed an impact evaluation of the After School Achievement Program (ASAP) located in the city of Houston using non-experimental and quasi-experimental data. The study shows that all mean juvenile crime variables for the period between August 2000 and May 2001, between 3 p.m. and 6 p.m., were significantly

lower than the three previous years. Other studies have focused specifically on prevention of sexual risk behaviors. Evidence from the National Prevention Program of Boys & Girls Clubs of America (BGCA) did not find significant differences among control and treatment groups on sexual attitudes and behavior found in the study (St. Pierre et al., 1995). Using a quasi-experimental evaluation with longitudinal data, they found that only non-virgins displayed marginally less sexual behavior at 15 months posttest than did the control group of non-virgins. This contrasts with evidence from other studies. Philliber et al. (2002) for example, performed an impact evaluation of the Children's Aid Society Carrera model Teen pregnancy Prevention after school program. This program was randomly assigned among NYC disadvantaged teens in the mid 80's. The authors used experimental design with multivariate regression and concluded that female program participants had significantly lower odds than controls of being sexually active (odds ratio, 0.5) and of having experienced a pregnancy (0.3). The program also had significantly elevated odds of having used a condom and a hormonal method during the last sexual encounter (2.4). Interestingly, participation in the program created no significant impact on male sexual and reproductive behavior outcomes.

### **Some Critiques of After School Programs and their Evaluations**

The mixed evidence of the effectiveness of ASPs can be explained by the diversity of program characteristics, outcomes measured, target population and the type of study done. While some ASPs target marginalized youth in general, others target youth at risk of dropping out of school, or youth already involved in gangs and dealing drugs. This heterogeneity often makes it difficult to perform comparative outcome evaluations across programs (Witt & Caldwell, 2005).

There are also many methodological concerns regarding ASP evaluations using experimental or quasi-experimental method designs. Several studies (Durlak, 1995; Miller, 2003) have indicated that true no-treatment control groups are a fantasy for school-based

promotion and prevention programs in after school programs. In most evaluations, true no-treatment control groups were clearly not obtained (Brooks-Gunn et al., 1995; Philliber et al., 2001; Rusche et al., 1999; Weisman et al., 2003). For example, Philliber et al. (2001) noted that up to 41 percent of their controls had participated in other after-school program activities, and Weisman et al. (2003) reported that half of their control group had participated in other programs or organized groups after school. This may have reduced the magnitude of effect in many of the current program evaluations or biased the results. Children and youth are sometimes doing some kinds of activities such as sports classes, music lessons, and private math tutors that are not part of a structured after school program, but that are also interventions changing certain outcomes. This makes difficult the task of finding a pure control group without any exposure to any after school activity. Furthermore, since some programs (and thus evaluations) work with students in risk of school failure, the comparisons must only be done between at risk treatment students with at risk control students (Lauer et al., 2006).

As with CCTs, many critiques with regard to ASP rely on the effectiveness of the programs and the quality of the service and activities provided. Some programs might offer for example quality art education and recreation with no activities for school performance improvement or risk prevention. Outcome evaluations measuring these two areas might not therefore find significant results. One example is the *San Francisco Beacon Initiative* (ASP). These centers were especially strong in providing activities in the arts and recreation and educational support areas. Using both quasi-experimental and non-experimental data, Walker and Arbreton (2004) indicated that while students in the treatment group significantly increased their positive perception of education, other indicators of academic functioning such as test scores or grades did not vary across treatment and control groups. ASPs not bound to state curriculum requirements might allow greater flexibility in meeting, for

example, the psychological needs of youth, but might not show positive or strong effects on educational achievement (Halpern, 2002).

### **Summary**

CCTs are important policy initiatives to ensure that investments in human capital of children are sustained, despite market failures such as capital market imperfections, asymmetries of information, conflict of interests among parents, external economic shocks and poverty. Reviewed studies used experimental, and quasi-experimental evaluation design methods. CCTs in Latin America have had significant impacts on enrollment rates and school attendance among program beneficiaries for boys and girls. Although few CCT programs in Latin America target specifically child labor, evidence suggests that CCTs might be reducing the income effect of schooling on the household, reduces the opportunity cost of going to school (and not working), all the while ensuring the investment is done on human capital. Despite these positive effects on schooling, evidence of child labor reductions is ambiguous.

Risky behaviors have important economic implications for adolescents since they not only affect their well-being and their health, but also their life prospects, their educational attainment, achievement and future earnings. Some risky behaviors might have negative externalities. Behaviors such as alcohol and drug use, can lead to crime, automobile accidents or dependence on the welfare state. CCTs have been shown to reduce sexual risky behaviors, but no significant reductions of teen pregnancy have been found. Factors other than school attendance and enrollment might be playing an important role here. ASPs targeting adolescents at risk have shown to have positive effects on academic outcomes and prevention of risky behaviors. Reviewed studies use experimental and quasi-experimental evaluation design methods.

## CHAPTER 4.

### THEORETICAL FRAMEWORK AND RESEARCH QUESTIONS

This chapter presents a simple economic framework that reflects the dynamics of adolescents' time allocation.<sup>29</sup> The Young Agent Project (YAP) conditionality and transfer flexibility is bound to interact in complex ways with adolescents' time allocation decisions between schooling, labor and risky behaviors. This study uses a theoretical framework that deals exclusively with adolescents' utility maximization and time allocation decisions with an individual budget constraint that might or might not include some transfers from the adults within the household.

This adolescent-centered framework is based on several age and family related characteristics. First, due to household income constraints, low-income adolescents in Brazil present a socio-economic and family structure that makes them become economically independent or start working to contribute to the household from an early age. The 'Luxury Axiom' theory suggests that a family will send their children to the labor market only if the family income drops very low (Basu & Van, 1998; Basu, 1998). In addition, family structure among low-income adolescents in Brazil could force them (by pressure or negligence) to make their own decisions about labor, schooling, or peers, by the age of 15 or earlier. As seen in the 2006 *Projeto Agente Jovem* sample descriptive statistics, many adolescents do not live with their parents, but instead with stepmothers or fathers, grandmothers, uncles, in-laws or other relatives. This family structure might reduce the willingness of adults to discipline the adolescent, act as positive role models or even to limit the amounts of unsupervised youth activity in the after school time. The legal factor can also contribute to this early independence, since in Brazil adolescents can obtain their work permit as early as 14 years.<sup>30</sup>

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<sup>29</sup> As discussed previously in Chapter 2, in Brazil's public schools, the daily instructional time is 4 ½ hours and is separated into two options: morning and afternoon. This allows children and adolescents to easily accommodate schooling and labor or a long unsupervised time in which they are more likely to engage in risky behaviors. See Chapter 2 with the description of the program.

<sup>30</sup> See Decreto N 3.597, de 12 de Setembro de 2000. See [http://www.planalto.gov.br/ccivil\\_03/decreto/D3597.htm](http://www.planalto.gov.br/ccivil_03/decreto/D3597.htm)



The YAP provides an excellent example of incentives that mandate changes in the minimum time adolescents allocate between schooling and an after school program. The cash incentive provides a second scenario in which the opportunity cost of attending school (and to stop working) is theoretically reduced. In addition, the fact that the YAP transfers the cash directly to the adolescent (75 percent of participants in the sample) or to the parents (23 percent), makes it necessary to consider a model that deals directly with the adolescent's utility maximization and consumption preferences. The decision to allow the transfer to go to the adolescent could be brought to bear by factors related to the age of the adolescent and to the family structure of the household. Information about the treatment group reveals that in 20 percent of the cases, adolescents were living with people other than their parents, including their grandparents, uncles/aunt, sibling and parents-in-law as heads of the households. In addition, in approximately 3 to 4 percent of the cases adolescents are independent from the household. Among that 75 percent that might live with the mother or the father, many might live with step fathers or step mothers. If the cash transfer goes, for example, to a step mother that has other children, she would use that money on her own children instead of the beneficiary. This is why the theoretical framework deals exclusively with adolescents' utility maximization and time allocation decisions. Because adolescents might work but still live with relatives, this study considers that the adolescents' utility maximization is subject to an individual budget constraint that might or might not include some transfers from the adults within the household.

Finally, creating a framework based on adolescents' utility maximization is particularly relevant in the case of the study of risky behaviors. Having unprotected sex, using contraceptives, cigarettes, alcohol or drugs are decisions taken by the adolescent and not by their parents. Developmental psychologists suggest that unlike adults, adolescents' decision-making is time invariant (and non-time constant like adults), meaning that they give

higher value for the consumption and the sensation-seeking of the present without calculating the consequences of their actions in the future.

### **A Model Equilibrium on Adolescents' Decisions of Schooling and Labor**

To show the income and substitution effect of the Young Agent Project, this framework uses and modifies according to the YAP characteristics, a simple, one period time allocation youth labor model based on Behrman, Parker & Todd (2007 and Becker, (1965). The theoretical framework deals exclusively with adolescent preferences, utility maximization, time allocation decisions and budget constraint.

The adolescent utility function is given by:

$$\mathbf{U} = \mathbf{U}(\mathbf{X}, \mathbf{h}_y^s) \quad (1)$$

Where  $\mathbf{U}$  satisfies the adolescents' preferences, which equals to the consumption of goods  $\mathbf{X}$  and the hours the adolescent or young adult spent at school  $\mathbf{h}_y^s$ . The adolescent maximizes its utility subject to an income constraint:

$$\mathbf{Y} = \mathbf{w}_y \mathbf{h}_y^{\text{LM}} + \mathbf{C}_y \quad (2)$$

In this constraint, income  $\mathbf{Y}$  is assumed to be obtained from the wages of the adolescent  $\mathbf{w}_y \mathbf{h}_y^{\text{LM}}$  which are already at the legal working age (16-20 years after the program). Where  $\mathbf{w}_y$  is the wage rate received by the adolescent in the labor market, and  $\mathbf{h}_y^{\text{LM}}$  is the hours worked by the adolescent.  $\mathbf{C}_y$  represents the income received by the adolescent from non-labor market sources, which includes any cash received from the YAP, as well as income received by the parents. Because the framework assumes that the hours an adolescent can spend at work is fixed, the adolescents' total income constraint is given by:

$$\mathbf{PX} = \mathbf{Y} = \mathbf{w}_y \mathbf{h}_y^{\text{LM}} + \mathbf{C}_y \quad (3)$$

Where  $\mathbf{P}$  is the average price level and  $\mathbf{X}$  is the consumption of goods by the adolescent. The adolescent also faces a time constraint:

$$T = h_y^{LM} + h_y^S \quad (4)$$

$$h_y^{LM} = T - h_y^S \quad (5)$$

Where  $T$  denotes the total amount of time available to the young individual and  $h_y^S$  denotes the amount of time dedicated to schooling. Substituting equation (5) into (3) yields:

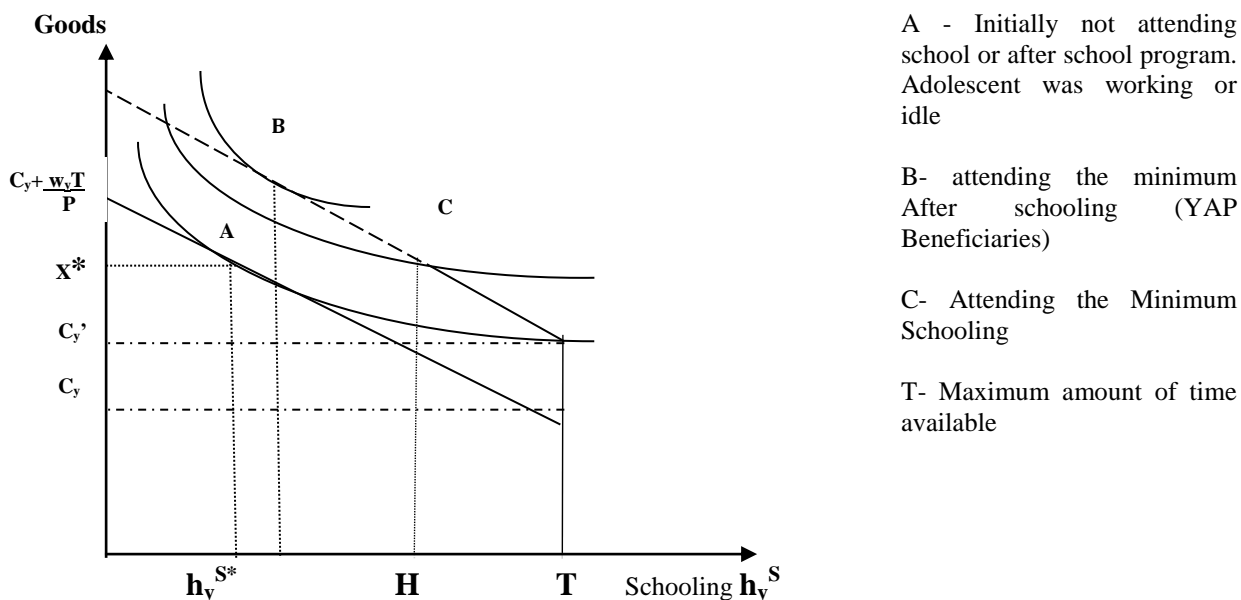
$$PX = w_y (T - h_y^S) + C_y \quad (6)$$

$$X = \frac{w_y T}{P} - \frac{w_y h_y^S}{P} + C_y \quad (7)$$

This combined budget line and time constraint is represented in figure 2 by the kinked line. When one combines the indifference curves derived from the utility function in (1) with the budget equation (7), the adolescent equilibrium occurs at point A, in figure 2, which determines the youth's schooling hours  $h_y^{S*}$  and his or her consumption,  $X^*$ .

Figure 2.

The Young Agent Project and the Time Allocation Decisions among Adolescents



Let  $H$  denotes the 80 percent minimum school and after school program attendance required by the YAP to receive the transfer. The program conditionality causes the budget constraint in the region to shift up without changing the slope and increases the non-labor

income upwards from point  $C_y$  to point  $C_y'$ . The additional cash is available only if the adolescent dedicates a minimum amount of time to school and to an After School Program. The amount of the cash transfer that is given to the adolescent or to the head of household (that could be given entirely or partially to the adolescent) is US\$33 monthly.

The impact of the YAP on hours of schooling is positive and it reflects two effects. First, an income effect operating through the added cash transferred through the YAP, which can vary depending on the extent to which added cash stimulates the youth to reduce working and stay at school (or at the After School Program). It is also the consequence of a pseudo-substitution effect, in the sense that the conditionality makes it more costly for the adolescent to work relative to fulfilling the YAP requirements (which provides greater income). The cash received by the adolescent can vary depending on whether they receive the transfer directly or not. If the transfer is given to the parents, then it is possible that the cash actually received by the adolescent may shrink substantially if the parents use some of the cash for other purposes. This could potentially diminish its impact on schooling, while increasing the need of the adolescent to work to pay for their own expenses.

### **Decisions between schooling and labor**

Given the adolescents' utility maximization as well as time and budget constraints, this framework considers that adolescents' can allocate their time in four different ways: 1) Specialization in school, 2) Combination of study and work, 3) Specialization in labor, and 4) Idleness (as extended leisure time). The combination of study and work comes at the expense of leisure time. Spending additional time in school and at the after school program as a result of the conditionality, can result in an increase of school grade completion among former program participants. Because the subsidy increases the relative benefit of school compared to work, it is also expected that the time spent in school and in the after school program will go up and the time spent working will go down.

### **Decisions over risky behaviors**

In addition, in the presence of the program and as a result of this new time allocation behavior, adolescents will be less likely to engage in risky behaviors because the new time allocation alters what determines status at school. With the after school program's new community of peers and teachers. Under this environment, education, hard work and *Ser alguém na vida* (To be someone in life) are features valued by peers within the program and characteristics that give status. This status would contrast with the status given by peers outside this community such as the frequent consumption of alcohol, cigarettes or drug use<sup>31</sup>. Regarding risky sexual behaviors, higher education attainment is expected to increase the use of contraceptives and reduce the likelihood of having a teen pregnancy. Because the Young Agent Project cash transfer is kept for the most part by the adolescent (Tables 1), it could be used for example to further consume contraceptive methods, that otherwise would have been very costly to pay. This framework assumes that a monthly transfer of \$33 US dollars is not enough to cover the high prices of consuming cocaine or marijuana.

### **Summary**

This dissertation presents a simple time allocation framework that reflects the dynamics of adolescents' time allocation between labor, schooling, leisure and risky behaviors. Under this framework, adolescents maximize their utility subject to the consumption of goods, schooling, leisure and status, with a combined (household and adolescent wage) budget constraint. Adolescents allocate their time in a way that they can maximize this utility function making decisions between studying only, working only, combining work and study or inactivity (idleness).

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<sup>31</sup> This model is based on the model of "Acting White" by Fryer (2010) to explain different behaviors among white and black youth. This paper elaborates a peer pressure model that predicts that acting white (defined as signals that induce educational investment and high wages for minority students) alters the equilibria due to peer group rejection among African Americans. Black students face two audience signaling quandary: behaviors that induce to labor market success, produce at the same time peer rejection. This pressure disincentives further investments on education or to acquire certain behaviors that considered in the community as acting white.

## **2. RESEARCH QUESTIONS**

This dissertation will respond to the following research questions. Each general question corresponds to one of the four result chapters (Chapters 6 to 9). The specific questions are addressed in all chapters.

### **General Questions**

1. What is the effect of the Young Agent Project on schooling outcomes, youth labor decisions and risky behaviors?
2. Is transferring cash directly to the adolescent more efficacious on improving schooling, labor and risky behavior outcomes?
3. Is program dosage, (measured by the number of hours per week given to the Young Agent Project after school program), a strong predictor of better outcomes?
4. Is Propensity Score Matching an efficient technique to correct for selection bias into the Young Agent Project?

### **Specific Questions**

5. Do former Young Agent Project beneficiaries experience less overage per grade relative to non-beneficiaries?
6. Does the effect of the YAP program differ by gender, ethnicity and region?
7. Is the YAP program reducing the likelihood of working or of being idle?
8. Are schooling and labor substitutes or complements for adolescents?
9. Has program participation improved job formality?
10. What is the relationship between schooling, the use of contraceptives and teen pregnancy and other risky behaviors?

## CHAPTER 6.

### METHODOLOGY

This dissertation uses an econometric analysis using Propensity Score Matching techniques, Average Treatment Effect on the Treated, Nearest Neighbor Matching with Replacement, to estimate the impact of the Young Agent Project (YAP) in Brazil on schooling, youth labor and risky behavior outcomes. The analysis is based on the *Projeto Agente Jovem 2006* dataset, an impact evaluation of the program hired by the Ministry of Development and Fight against Hunger (MDS)<sup>32</sup> in Brazil and Datauff<sup>33</sup> at the Federal University Fluminense of Niteroi. This study performs a sensitivity analysis with two additional model specifications and robustness check comparing the treatment effects of linear regressions with Inverse Probability of Treatment Weighting (IPTW) and concludes that selection bias into the YAP does not affect the causal estimates of this study. This chapter contributes to the lack of empirical evidence on interventions that address schooling, youth labor and risky behaviors among adolescents aged 15 to 17<sup>34</sup> with well-known econometric specifications (Propensity Score Matching and Probit models) while exploring a less known method, (Inverse Probability of Treatment Weighting). Since the YAP was not randomized, these methods intend to correct for the selection bias of participants into the program.

#### **Data**

The *Projeto Agente Jovem 2006* dataset is the data source for this dissertation empirical inquiry. This dataset is a joint project of the Brazilian MDS and DataUFF to evaluate the impact of the YAP among adolescents and was administered to 2,210 households in 81 small, medium and large cities across Brazil. The sample is representative

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<sup>32</sup> *Ministério de Desenvolvimento e Combate à Fome (MDS)*

<sup>33</sup> *Núcleo de Pesquisas Sociais Aplicadas, Informações e Políticas Públicas da Universidade Federal Fluminense de Niterói – Brasil*

<sup>34</sup> This refers particularly to the case of research in Brazil, where most studies and surveys are used for descriptive statistics only. See for example the impact evaluation done for the Young Agent Project by DataUff (Brandão et. al, 2008). Furthermore, most CCT impact evaluation or studies regarding child labor in low income countries study younger children.

of the recipients of the YAP across socio-economic status, family wages (given the conditionality to be a recipient), regions, states, genders and ethnic groups. All state capitals were included in the sample and medium and small municipalities were selected according to their proportional size probability and the size of the population that is in the program.

The YAP was never randomized across the population. From the beginning of the program, any eligible candidate in terms of age and family income can benefit from the program. Since adolescents can self-select into the program, this program characteristic creates a strong selection bias problem that could affect the causal inference made about the effects of the YAP on schooling, labor decisions and risky behavior outcomes. Even though adolescents that benefited from the YAP are from low income families, outcomes could be associated with personal characteristics such as motivation, ability or access to information.

The treatment group in this survey is composed of former YAP beneficiaries that had participated one or two years in the program between 2002 and 2005, and had since left the program at least one year prior to implementation of the questionnaire in September 2006. By the time of the survey, former program beneficiaries were aged 16 to 20. DataUff used statistical controls to select a comparison group as similar as possible to the treatment group given crucial socio-demographic characteristics (e.g. income eligibility, age, gender). The surveys were implemented to the control group in the same municipalities and neighborhoods that ex-beneficiaries from the treatment group were being surveyed. Initially the sample had a treatment group of 1,698 and a control group of 512. A total of 27 adolescents were excluded from the sample, since some individuals from the control group were younger (aged 15) and older (23 and 24) than the control group and the condition to be part of the survey. I also excluded from the original sample adolescents that participated in the program in 2006, the



year of the sample.<sup>35</sup> After excluding these individuals, the sample consists of a control of 495 and a treatment group of 1,688 adolescents and young adults that by the month of the survey in September 2006, were aged 16 to 20.

The survey contains a first set of questions made directly to the adolescent that includes items such as personal characteristics, education, labor, wages, socialization and leisure, sexual behaviors, use of drugs, tobacco or alcohol, violence and political and social projects participation. The second set of questions includes the adolescents' participation or knowledge about other social federal programs. The third set of questions was made exclusively to the treatment group about the YAP's cash transfer and after school program activities. Finally, the last section included questions made directly to parents or the head of the household (relatives or a grandmother), about the household composition and consumption patterns (See Appendix E to see the questionnaire in Portuguese).

### **Outcome Variable Description**

Brazilian education has shifted from equalizing access to equalizing learning attainment. While barriers to school access have diminished in importance, issues such as school dropouts, age grade delays, youth labor, teen pregnancy and gang and drug involvement have become greater determinants of school attainment and earnings in recent years (Bruns et al., 2012). This is why current policies have shifted their focus to targeted preventive interventions in basic education for low-income families and youth who are falling behind (or at risk).

### ***Schooling Outcomes:***

In this dissertation, I shift from the traditional study of the effect of CCTs on school access and enrollment (Rawlings & Rubio, 2005; Cardoso & Portela Souza, 2004) to the

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<sup>35</sup> This might have been an error in the survey implementation or data entry since all adolescents in the treatment group had to be done with the program for at least one year at the moment of the survey.

study of school completion and college aspirations.<sup>36</sup> All schooling outcomes are expressed by grade completion dichotomous outcomes in which completing at least the grade by September 2006 = 1, otherwise = 0

- COMPLETED MIDDLE SCHOOL. Gives a value of 1 if by the time of the survey (September 2006) adolescents have completed at least a High School degree and a value of 0 otherwise.
- COMPLETED HIGH SCHOOL. Gives a value of 1 if adolescents have completed at least Middle School. Adolescents aged 16 and 17 are excluded.
- COLLEGE ASPIRATIONS. Gives a value of 1 if adolescents and young adults that have the aspirations to attend at least college; otherwise, the value given is 0.

As seen in the background chapter, Brazilian youth is heavily affected by school late entrance, grade repetition and school dropouts. To study this age-grade delay, this study restricts the sample to 17 and 18-year-olds separately, and looks at the likelihood of completing middle school, high school (as seen above) and the last two years of high school.<sup>37</sup>

- COMPLETED SOPHOMORE. Measures whether adolescents and young adults surveyed had completed their sophomore year by the time of the survey.
- COMPLETED JUNIOR. Measures whether adolescents and young adults surveyed had completed their junior year by the time of the survey.

The Adolescents in the control and treatment groups aged 16 were not included due to the small number of observations (total N = 260, treatment N = 154, control N = 106). Those aged 19 to 20 were not included in this analysis since they would already be age-grade delayed at the completion of any high school grade. In the absence of age-grade delays, at the

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<sup>36</sup> All these grade completion variables were recoded from the question asked about the last year of education completed among the control and the treatment group. Categories went from the literacy program and included all years of primary and secondary school and entered into college (See Table \_ in Appendix \_ for more details about the recoding and questions asked).

<sup>37</sup> See Chapter 2 for an explanation of the Brazilian education system and grade equivalencies with the American system.

age of 17 all young should have completed at least their junior year in high school and by the age of 18 all young must have completed high school. This assumption is based on the average high school graduation age in Brazil<sup>38</sup> and the fact that this survey was done in September near the end of the school year. Many of these adolescents might have been close to completing (or failing) a grade or an education level.

***Study and Labor Outcomes:***

Traditional studies of child labor and that of CCTs studying child labor in Latin America, calculate for the most likely probability of working or studying, considering them as substitutes (Berhman, Parker, & Todd, 2007; Edmons & Schady, 2009). As seen in the theoretical framework, in this study, this study assumes instead that adolescents make decisions on time allocation (other than leisure) in four different ways: 1) Specialization in school, 2) Combination of study and work, 3) Specialization in labor and 4) Inactivity or idleness. In this sense, the data to show whether school and labor can also be complements, as well as introducing adolescents to be idle.<sup>39</sup> Since the survey was implemented after the end of the adolescents' participation in the YAP, these outcomes reflect post-treatment decisions and behaviors. In order to see the characteristics of this employment, this study calculates the effect of the program on having a formal job among those that reported being working.

- **ONLY STUDYING.** A value of 1 is assigned to adolescents that reported only studying during September 2006 and a value of 0 was given otherwise.
- **STUDYANDWORK.** A value or 1 is given to adolescents that reported studying and working during September 2006. A value of 0 was given otherwise.

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<sup>38</sup> See Chapter 2 on Brazil's Education system.

<sup>39</sup> These variables were constructed from the interaction of two questions: "Are you studying at the moment" and "Are you working at the moment" I created interactions to see how many individuals were both studying and working at the moment of the interview, were only working, only studying, studying and working or neither.

- ONLY WORKING. A value of 1 is assigned to adolescents that reported only working and a value of 0 was given otherwise.
- IDLE. A value of 1 is assigned to adolescents that reported not studying and not working and 0 was assigned otherwise.
- WORK WITH A PERMIT. A value of 1 is assigned to the adolescents that reported being working and having a work permit, otherwise they were assigned a value of 0. Individuals that reported not working were excluded from the sample.<sup>40</sup>

***Risky Behavior Outcomes:***

Adolescents seem to give a higher utility of an activity in the present that seeks status and/or sensation, without thinking about the long-run implications of pursuing certain risky activities. The way adolescents live their sexuality and protect themselves has implications of the likelihood of getting Sexually Transmitted Diseases (STDs) or having a teen pregnancy. Risky behaviors or the consumption of cigarettes and alcohol that are often a gateway to drugs have implications for education attainment, future jobs and earnings. The third set of outcomes of this study includes the use of contraceptives, risky sexual teen pregnancy and the consumption of products such as cigarettes, alcohol and drugs. Teen pregnancy includes two different variables: planned teen pregnancy and unplanned teen pregnancy. Making this distinction is important since teen pregnancies could either be wanted or consequences of an accident. Due to legal, cultural and monetary issues, most low-income adolescents opt to continue with pregnancies.<sup>41</sup>

- USE OF CONTRACEPTIVE METHODS measures the frequency in which adolescents use contraceptive methods during sexual relations: Never = 0, Rarely = 1,

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<sup>40</sup> This variable was constructed from the question: "Which was your occupational situation by September 2006?" Options given included a variety of occupations with two possibilities each, with work permit and without work permit: 1. Domestic employee with permit, 2. Domestic employee without permit, 3. Employee with work permit, 4. Employee without work permit, 5. Self-employed with permit, 6. Self-employed without work permit, 7. Does petty jobs, 8. Works in the military, 9. Government official, 10. Does not work.

<sup>41</sup> Not only is abortion not legal in Brazil, but due to Catholicism it is culturally not accepted. Illegal abortions occur in clandestine clinics, but statistics of abortions only exist with complications that need medical intervention.

Almost Always = 2, Always = 3. The sample only includes adolescents that reported being sexually active.

- TEEN PREGNANCY is a binary variable that gives a value of 1 if a female became pregnant or a male impregnated a woman during or after participation in the program; otherwise, the value is 0.
- UNPLANNED PREGNANCY gives a value of 1 if in the case of pregnancy, this was an accident or not planned;<sup>42</sup> otherwise the value is 0.

The final set of risky behavior outcomes includes the use of cigarettes, alcohol and drugs. As with risky sexual behaviors, the high consumption of these products can lead to violent behavior, crime and in the case of cigarettes and Marijuana, can be the gateway to harder drugs such as cocaine and heroin.

- FreqCIGARRETES is a categorical variable that measures the frequency in which adolescents smoke cigarettes: Never Used = 0, Only Experimented = 1, Uses Sometimes = 2, Uses Every Day = 3.
- FreqALCOHOL is as categorical variable that measures the frequency in which adolescents drink alcohol: Never = 0, Only Experimented = 1, Less than Once a Month = 2, Twice a Month = 3, Once or Twice a Week = 4, Three to Four Times per Week = 5, Every Day = 6.
- UseDRUGS measures if by the time of the survey the adolescent was using at least one of the following drugs: inhalant glue, amphetamine, cannabis, cocaine, crack or heroin.

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<sup>42</sup> The question asked to adolescents: *Was the pregnancy planned? (1. Ja ficou gravida ou engravidou alguem? 2. A gravidez foi planejada?)* creates some doubts about the inferences that can be made with this variable. What does ‘planned’ mean and how do adolescents understand ‘planning’? Furthermore, it could be assumed that in the presence of the parents, adolescents might have lied about the reason of the pregnancy. See more about this discussion under the Limitations section.

## Samples and Subsamples

The total sample includes 2180 observations with a treatment group of 1688 and a control group of 495 adolescents. This research performs the analysis across the same set of covariates by gender (1126 females and 1056 males), ethnic groups (520 Whites, 1005 *Pardos* and 485 Pretos/Black) and regions (579 Northeast and 972 in the Northeast).<sup>43</sup>

Table 1

### *Projeto Agente Jovem Sample Characteristics*

	Males	Females	Whites	<i>Pardo</i>	Petro	North East	South East	North	Center West	South	Total
Control	229	266	141	232	104	131	199	65	60	40	495
Treatment	828	860	379	827	391	448	733	190	178	99	1,688
Total	1,057	1,126	520	1,059	485	579	972	255	238	139	2,183

Note: Author's own calculation based on the 2006 *Projeto Agente Jovem* Database

The second set of samples corresponds to adolescents that reported having received the transfer directly (N = 1262) with those that reported that the head of the household received the transfer (N = 403). The third set of samples corresponds to the after school program dosage analysis. High Dosage (attendance of 80 or more percent of the time) has a sample of 666 adolescents. Middle Dosage (attendance of 50 to 79 percent of the time) has a sample of 632 individuals and Low Dosage (attendance of less than 49 percent of the time) has 395 participants.

Finally, in order to analyze a possible self-selection into the program, this study divided the sample into those adolescents that reported having been recruited by the program (N = 529) and those that reported having looked at the program due to their own initiative (N = 1139). Table 2 and 3 in this Chapter, and Appendix D, show the number of observations of the control and treatment group for each of the subgroup analysis. The reasons for this

<sup>43</sup> Due to the low number of adolescents in the treatment and control group in the North, Center West and South regions, I limited my analysis to the Northeast and Southeast regions (See Table E5, Appendix B).

sample choice will be developed in the results chapter<sup>44</sup> (See Table 2 in this section for the descriptive statistics of all covariates and samples within the Treatment and Control group).

### **Research Design: Using Propensity Score Matching**

The YAP was a never randomized program and the *Projeto Agente Jovem* 2006 dataset only contains post treatment information. Because adolescents were not randomly assigned into the treatment and control group, this study uses Propensity Score Matching techniques, with Average Treatment Effect on the Treated (ATT), Nearest Neighbor with Replacement, as the main econometric technique to make causal inferences about the effects of the YAP on education, labor and risky behavior outcomes.

Propensity Score Matching was designed by Rubin and Rosenbaum (1980) in order to assess program effects in the absence of a randomized experiment with a control group. Evidence suggests that in the absence of randomization, Propensity Score Matching is a more robust technique than other methods such as linear regressions with covariates due to the fact that it manages to control for possible selection bias of the treatment group (Rubin, 1997; Morgan & Winship, 2007). The aim of Propensity Score Matching methods is to match up or pair an individual who received a treatment (such as a beneficiary of the YAP) with an individual who did not receive the treatment, taking into account crucial characteristics that would make them comparable to the treatment. Propensity scores are calculated as the estimated probability of becoming part of the treatment group that received the cash transfer conditional on both schooling and after school program attendance given the measured covariates (Rosenbaum & Rubin, 1985; 1984). Due to the fact that in this study the CCT program was not assigned randomly, this methodology will allow corrections for possible selection bias into the program. The constructed control group and the treatment group would look as similar as possible by matching both groups across crucial covariates.

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<sup>44</sup> Each sample group represents a section in the result chapter that responds to a different research question.

One of the advantages of using this method is that it does not impose arbitrary assumptions on the linear relationship between outcomes and covariates as in most regression models. In addition, it removes treated or untreated adolescents from the samples that have no obvious match in the other group that could create a bias, making both groups as similar as possible on observable variables (Rosenbaum & Rubin, 1985). Nevertheless, as in the case of linear regressions, the causal interpretation of Propensity Score Matching rests on the unverifiable assumption that no unobserved variables are correlated with the outcome and with the likelihood of getting selected into the Young Agent Project. Unobservable characteristics such as motivation, ability, and access to information or networks could be correlated to the outcomes, biasing the causal inferences made in this study.

In the case of the selection into the YAP, the assignment or selection of a program like the Young Agent Project often involves purposive placement, reflecting on either the choices made by those adolescents eligible and/or by the administrative personnel of the program. The Young Agent Project requires, for example, that administrative people target and recruit young people at risk (Brandão et al., 2008). Nevertheless, because a cash transfer is involved, it could also be the case that the administrative personnel tend to benefit and recruit adolescents within their networks and known people (that fulfill the federal government requirements). There can thus be either positive or negative self-selection into the program. Positive self-selection would mean that participants self-select into the program due to special characteristics, sometimes unobserved, such as motivation, access to information, existence of networks or connection among the community or within the program. Negative self-selection means that program participants have personal characteristics (often also unobserved) that make them even more at risk than other adolescents with the same socio economic and other characteristics. This can be the case of young at risk or already in local gangs, or young that left their homes with personal non-



observable characteristics that can make them even more likely to drop out of school, work or incur into risky behaviors.

### Identification Strategy Using Propensity Score Matching

The standard analysis of the relationship between having participated in the program and having better schooling, labor and risky behavior outcomes involve the following equation:

$$(1) \Pr (Y = 1 | X_i) = \beta_0 + \beta_1 \text{TREAT}_{\gamma k} + \beta_2 X_{ki} + e_i$$

Where the probability of the  $i$  adolescent experiencing  $Y$  (schooling outcomes, youth labor outcomes and risky behavior outcomes) is determined by the participation in the YAP (where  $\text{TREAT} = 1$  is the treatment group and  $\text{TREAT} = 0$  is the control group),  $X_{ki}$  reflects other factors that influence the outcomes. The coefficient of interest is  $\beta_1$  which represents the estimated change in the probability of having outcome  $Y = 1$  associated with adolescent participation in the YAP. The Propensity Score Matching model relies on the same structural assumptions for causal inference as a linear regression model does with the selection on observables assumption. In order to make causal assumptions using a propensity score matching, some assumptions must hold. Under Propensity Score Matching, the treatment effect on the treated is denoted as:

$$(2) E [Y_1 - Y_0 | Z = 1] = E(Y_1 | Z = 1) - E(Y_0 | Z = 1)$$

Where  $Z = 1$  is the treatment group that benefited from the YAP and  $Z = 0$  is the control group,  $Y_1$  is the outcome of the treatment group and  $Y_0$  is the outcome of the control group.

To solve the selection problem into the YAP, Propensity Score Matching methods impose the following conditional independence assumption, suggesting that it is conditional on a given set of covariates ‘ $X$ ’ the nonparticipation outcome ( $Y_0$ ) and the program participant outcome ( $Y_1$ ) is independent of the treatment ( $Z$ ):

$$(3) (Y_0, Y_1) \infty Z | X$$

The conditional independence assumption essentially suggests that given the set of  $X$  observable covariates, people in the control and the treatment are equally likely to have received the treatment and that by matching propensity scores, all observed and measured differences between the treatment and control groups are captured. Another important assumption under Propensity Score Matching methods is that the effect of treatment can be measured only for those individuals who have a matching case in the other group. This area of overlap in propensity scores is known as the “common support” (Imbens, 2004). Finally, the last assumption required by the matching estimation is SUTVA (Stable Unit-Treatment Value Assumption) (Rosembaum & Rubin, 1983). Under this assumption, the treatment of a unit affects only the outcome and in a sample, the outcome of the given Unit  $I$  is independent of the outcome of Unit  $J$  given treatment. In theory, if these assumptions hold, and we match on the propensity scores (3), we can have unbiased causal estimates (Rosenbaum & Rubin, 1983). For matching, a predicted probability of being assigned to the treatment for each of the cases using logistic or Probit regression is generated:

$$(4) \Pr(YAP_i = 1 | X_i) = \beta_0 + \beta_2 X_{ki} + e_i$$

Where  $YAP = 1$  is the treatment group,  $X$  is a vector of covariates that include socio-economic, demographic and other characteristics and  $e$  denotes the error term (See Table 2).

### Using Propensity Score Matching

Several steps were followed to calculate the effects of the YAP using Propensity Score Matching. First, this study performed the balance checks which included crucial covariates without the outcome estimation. The distribution across the covariates (using *PSBAL* command in *STATA*) was obtained and compared in order to ensure that there was an adequate balance. Looking at the pre and post matching differences in means and standard deviations of the covariates, this study was able to choose the best specification model (as

seen in Table 3. As in any linear regression model, if an important confounding variable is not included, the estimate could be biased. That is why the proposed study uses measures of adolescent demographics such as ethnicity, gender, age and region as well as household background characteristics such as number of children younger than 16 in the household, education attainment of the head of the household, whether the mother is the head of the household and socio-economic status. These confounding covariates were cautiously selected to avoid including post treatment variables. Gelman and Hill (2007) suggest that if post treatment variables were included we would be comparing units that are not comparable as can be seen by looking at potential outcomes.<sup>45</sup> Secondly, this study checked whether there was sufficient overlap across control and treatment group covariates by using the histograms. As the theory specifies, if the adequate overlap among treatment and control groups is in a mirrored effect, obtained differences in mean outcomes between the treatment group and the matched comparison group can be used as treatment effect estimates (Gelman & Hill, 2009). Based on this balance checks and the sufficient overlap in the histogram, the final set of covariates used in the main model were chosen. As seen in Table 3 and Figure 3 below, a good balancing specification was obtained in which after matching, the means and standard deviations between the treatment and the control groups were as similar as possible. The command PSBAL in Stata was used for obtaining these means and standard deviations for the treatments and control groups before and after matching. In addition, as seen in the figure 3 in this section, the treatment and control group show enough overlap across the propensity score.

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<sup>45</sup> Although the survey also contained information about the participation of adolescents on other federal social programs, it was not possible to include them as a covariate due to the lack of information on when they benefited from those other programs. See the limitation section for more information about this issue.

Table 2

*Descriptive Statistics by Sample*

Covariates	Description	Total	Control	Treat	Cash to Teens	Cash To Parents	High Dosage	Medium Dosage	Low Dosage
Women	If adolescent is a female = 1, male =0	0.52	0.54	0.51	0.52	0.49	0.51	0.51	0.51
Age	Ages 16 to 20	<b>17.68</b>	<b>17.49</b>	<b>17.74</b>	<b>17.76</b>	<b>17.69</b>	<b>17.67</b>	<b>17.74</b>	<b>17.85</b>
	Age 16	11.91	21.41	9.12	8.64	9.43	10.66	9.41	6.08
	Age 17	30.05	28.48	30.51	30.51	31.27	32.73	39.55	27.34
	Age 18	38.16	32.53	39.85	39.46	41.94	37.69	78.95	44.05
	Age 19	17.96	15.15	18.78	19.49	15.88	16.97	19.30	21.01
	Age 20	1.92	2.42	1.38	1.90	1.49	1.95	1.30	1.52
SESTATUS	<i>Critério Brasil</i> with 7 categories. a1. a2. b1. b2. c. d. e. being B the highest and E the lowest <sup>46</sup> .	<b>1.34</b>	<b>1.36</b>	<b>1.34</b>	<b>1.33</b>	<b>1.35</b>	<b>1.34</b>	<b>1.33</b>	<b>1.36</b>
	Class B (=3)	2.38	1.21	2.73	5.78	3.23	3.30	5.74	1.77
	Class C (=2)	34.95	37.98	34.06	57.61	34.24	34.23	59.33	36.71
	Class D (=1)	57.26	56.77	57.41	33.99	56.82	55.71	32.22	57.22
	Class E (=0)	5.41	4.04	5.81	2.61	5.71	6.76	2.71	4.30
EducATthead	Categorical variable, last education level attained by the head of the responsible. Higher values were given to higher levels of education.	<b>2.27</b>	<b>2.47</b>	<b>2.21</b>	<b>2.19</b>	<b>2.24</b>	<b>2.16</b>	<b>2.22</b>	<b>2.29</b>
	Illiterate/without education (= 0)	9.62	8.69	9.89	9.27	12.41	11.56	9.41	7.85
	Incomplete primary School (= 1)	27.07	26.87	27.13	28.84	22.08	29.43	24.88	26.84
	Complete Primary School (=2)	22.81	17.37	24.41	24.88	23.57	23.12	27.43	21.77
	Complete Middle School (= 3)	21.48	20.61	21.74	20.21	25.31	17.57	22.49	27.59
	Incomplete High School (= 4)	6.83	10.51	5.75	5.55	6.20	6.16	5.58	5.32
	Complete High School (= 5)	11.22	14.95	10.13	10.46	8.93	10.96	9.41	9.87
	Incomplete Higher Education (= 6)	0.37	0.40	0.36	0.24	0.74	0.15	0.64	0.25
	Complete Higher Education (= 7)	0.6	0.61	0.59	0.55	0.74	1.05	0.16	0.51

<sup>46</sup> *Critério Brasil* is a measured used by the Brazilian Government as a proxy for socio economic status of the household. It takes into account consumption patterns, education attainment of the head of the household. <http://www.abep.org/novo/Content.aspx?SectionID=84>

<b>Covariates</b>	<b>Description</b>	Total	Control	Treat	Cash to Teens	Cash To Parents	High Dosage	Medium Dosage	Low Dosage
Child0to14Household	Dependent children living in the household aged 0 to 14 = 1,	0.65	0.63	0.66	0.66	0.66	0.66	0.66	0.67
WORKINGbfr15	Adolescent started working before the age of 15 or before = 1 otherwise =0	15.74	15.75	15.73	15.76	15.66	15.72	15.70	15.82
MOTHERheadHouse	Mother is the head of the household =1 , other family members =0	0.43	0.38	0.44	0.45	0.41	0.44	0.42	0.48
<b>Regions</b>									
<b>Sensitivity Analysis</b>									
Northeast Region	Adolescent lives in the Northeast region	0.27	0.26	0.27	0.19	0.51	0.28	0.33	0.15
Southeast Region	Adolescent lives in the Southeast region	0.45	0.40	0.46	0.56	0.14	0.45	0.37	0.61
North Region	Adolescent lives in the Northern region	0.12	0.13	0.11	0.11	0.11	0.07	0.15	0.13
Center West Region	Adolescent lives in the Center -West region	0.11	0.12	0.11	0.09	0.16	0.15	0.10	0.04
Southern Region	Adolescent lives in the Southern region	0.06	0.08	0.06	0.05	0.08	0.06	0.05	0.08
<b>Samples</b>		2180	495	1688	1262	403	666	627	395

Note: Author's own calculation based on the 2006 *Projeto Agente Jovem* Databas

The final model was selected based on the balance in absence of the outcome variables; this is often considered a more honest model. Inferences under this model tend to be fairly robust to misspecification of the model used for estimating propensity scores (Drake, 1993). Table 3 shows the descriptive statistics by sample of the final covariates selected as well as that of regional dummies that were included for Model 2 of the sensitivity analysis. The balance checks for all other samples and subsamples were included in Appendix F.

### ***Missing Data***

Like most surveys, The 2006 *Projeto Agente Jovem* dataset suffers from problems of missing data on some of the most important covariates. Studies suggest that missing data can bias the results when the missing observations exceed 5 percent. In the case of the chosen covariates, only 0.2 to 0.6 percent are missing observations. Since this number was too small to create dummies, I performed a multiple imputation (Using the MI command in Stata12) on the covariates with missing observations such as “Education attainment of the head of the household” (0.59 percent), “The number of children below 15 years of age living in the household” (0.28 percent) or, whether “The adolescent started working before the age of 15” (0.23 percent).

Table 3

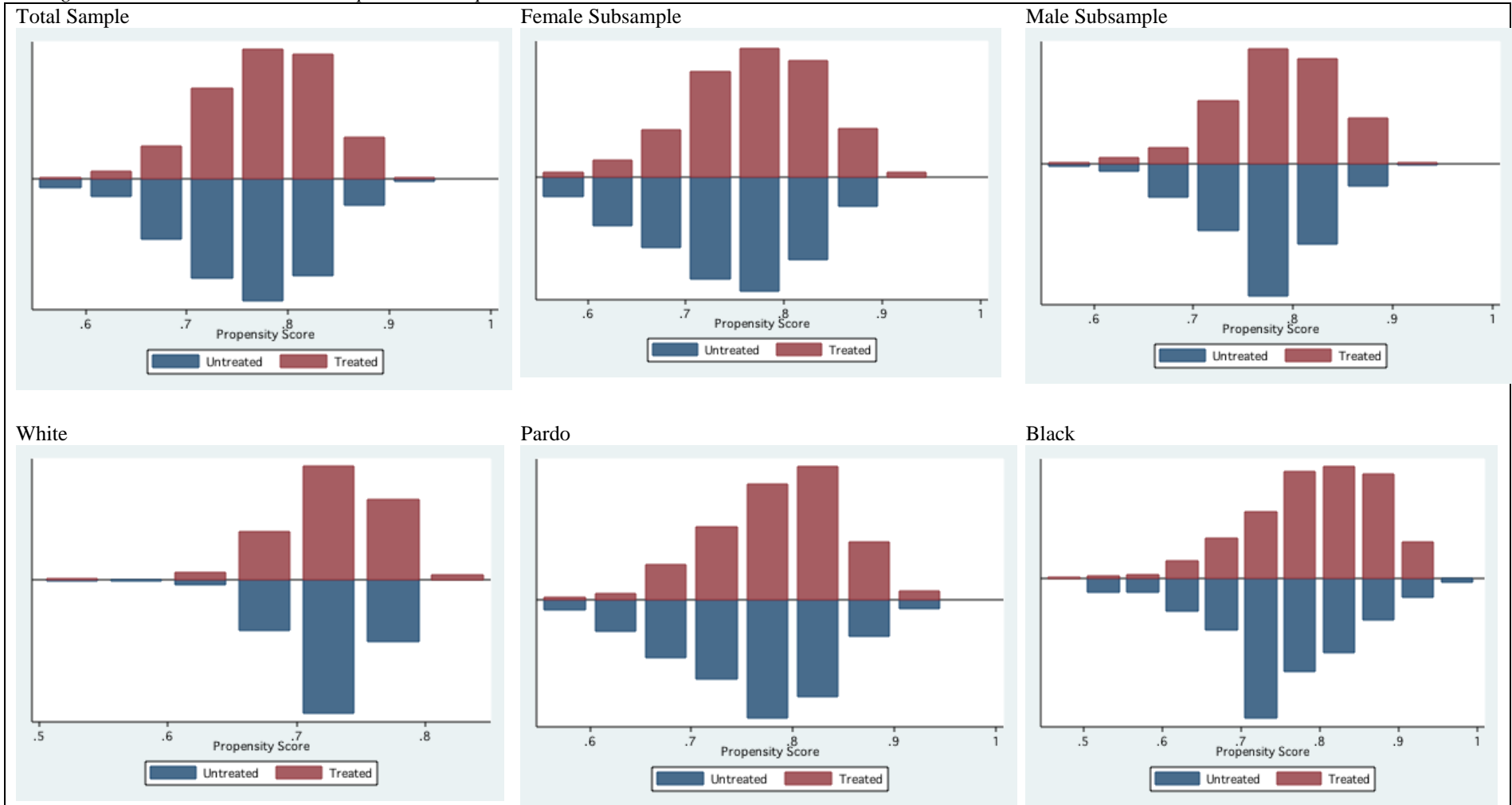
*Balance Check Total Sample*

Covariate	Sample	Mean		SD	
		Treated	Control	Treated	Control
TREAT	Unmatched	1	0	0.0	0.0
	Matched	1	0	0.0	0.0
WOMAN	Unmatched	0.51	0.54	0.5	0.5
	Matched	0.51	0.54	0.5	0.5
AGE	Unmatched	17.74	17.49	0.9	1.1
	Matched	17.74	17.72	0.9	1.0
SESTATUS	Unmatched	1.34	1.36	0.6	0.6
	Matched	1.34	1.31	0.6	0.5
Education Attainment Head Household	Unmatched	2.21	2.47	1.5	1.6
	Matched	2.21	2.11	1.5	1.5
CHILDREN 0 to 16 in the Household	Unmatched	0.66	0.63	0.5	0.5
	Matched	0.66	0.69	0.5	0.5
Started Working before 15	Unmatched	15.74	15.75	0.8	0.7
	Matched	15.74	15.83	0.8	0.6
Mother Responsible for the Household	Unmatched	0.44	0.38	0.5	0.5
	Matched	0.44	0.41	0.5	0.5

Note: Author's own calculation using psbal with the 2006 *Projeto Agente Jovem* Database

Figure 3

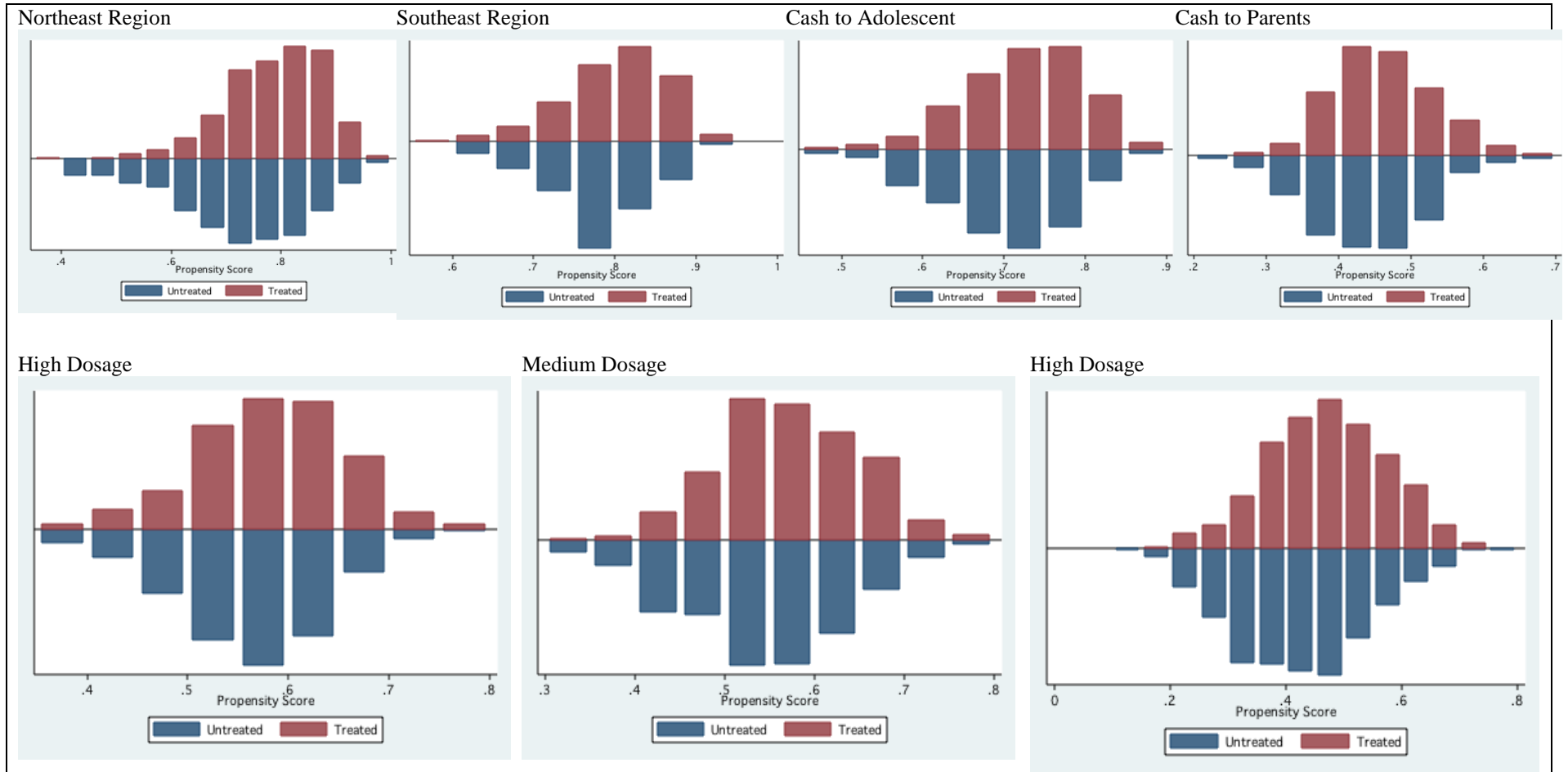
*Histogram Treatment and Control Group – Total Sample*



Note: Author's own calculation using psbal.ado in stata based on the 2006 *Projeto Agente Jovem* Database



Figure 3 (Continue)



### **Limitations of the Analysis**

There are several limitations to the econometric analysis and potential measurement errors in this study. The first limitation for this analysis could be the small sample size, particularly for some of the subsamples such as ethnicity and regions. This sample size will be reflected on the standard errors and can affect my statistical power of the coefficients. Indeed, analysis conducted using smaller sample sizes is more likely to find non-significant coefficients, due to large standard errors. Secondly, there might be measurement problems with some of the variables due to the recoding employed as well as to the characteristics of the questions asked in the survey. The recoding of the variable IDLE that measure idleness might as well present a problem since it might not take into account the situation of females that stay at home to take care of a relative and/or perform domestic duties. Furthermore, due to the characteristics of the question, it only represents a snapshot of what adolescents were doing during the month of September 2006, when the 2006 *Projeto Agente Jovem* survey was implemented. That is why it is important to be careful about the inferences drawn from these variables. The survey asked, for example, whether the adolescent had been pregnant, TEENPREGNANCY, when did the pregnancy occur and whether the pregnancy was planned UNPLANNEDPREGNANCY (*A gravidez foi planejada?*). The problem is that many adolescents might not really understand what ‘to plan’ means and whether planned is synonymous of “wanting to get pregnant.” In addition, because this is data obtained from self-reported behaviors, if the survey was implemented to adolescents in the presence of their parents or relatives, they might have lied about the real cause or motives of the pregnancy as well as about their consumption of cigarettes, alcohol and drugs. Third, due to the large amount of social programs in Brazil targeting low-income adolescents and their families, schooling, labor and risky behavior outcomes, the placement into the Young Agent Project might be correlated with previous participation in other programs. In addition, Evangelical

and Catholic churches tend to be very active in Brazilian *Favelas* offering services for the community and youth at risk. Although the survey contained information about the participation of adolescents in other federal social programs, it was not possible to include them as a covariate due to the lack of information on the year they benefited from those other programs. Furthermore, no information was available about the adolescent (or the household) participation in other local or church sponsored welfare programs. Therefore, even if the participation in other public assistance programs may confound the causal estimates of this study, since post treatment variables are likely to be affected by the treatment itself, therefore biasing the coefficients. Including post treatment variables as confounding covariates on the model might therefore strongly affect the parametric assumptions that need to be held in order to make causal inferences when using Propensity Score Matching Methods (Gellman & Hill, 2009).

Finally, it has been argued that Propensity Score Matching methods do not correct more selection bias than linear regressions do (Agodini & Dynarsky, 2004). Propensity Score Matching methods rely on the same structural assumption for causal inference as linear regressions (namely the selection on observables assumption) and like a regression analysis, the causal interpretation of Propensity Score Matching results rest on the assumption that no unobserved variables are correlated with the outcomes and with the probability of being assigned to the treatment group (e.g., motivation or ability). The sensitivity analysis and particularly the comparison of treatment effects between linear regression and the Inverse Probability of Treatment Weighting are meant to explore the robustness of the results obtained with Propensity Score Matching methods. Despite this limitation, it is necessary to take into account that there are very limited additional methods that can be used nevertheless with matched non experimental data without a random assignment such as the *Projeto Agente Jovem* 2006 Dataset. Without pre and post treatment data, this study cannot implement a

Difference in Difference (DD) method, or an Instrumental Variable (IV) approach, due to the absence of a strong instrument. No information was available in the survey about randomly assigned characteristics that are not correlated with the outcome or with the treatment assignment. For example, a commonly used variable as an instrument has been distance to the school (or to the after school program), but such a variable was not available in the survey. In addition, “Distance to School” is not a good instrumental variable in the case of the Young Agent Project since urban youth in Brazil who lives in areas in which public schools are largely available.

### **Robustness Checks**

The last of the results chapter performs two types of robustness checks: 1) a sensitivity analysis applying Propensity Score Matching to a different set of covariates, 2) a comparison of the treatment effects obtained from a Probit and Inverse Probability of Treatment Weighting.

#### ***Sensitivity Analysis Using Propensity Score Matching***

Gibson-David and Foster (2006) suggest that while including too few covariates in a Propensity Score Matching model might increase the model bias, including too many covariates might create some limitations of the results in terms of external validity. That is why this study performs a sensitivity analysis comparing the main model (as explained in Table 2, page 77 and 78) with two additional models that include a different set of covariates. Model 1 includes the same covariates as the main model, except for gender. Model 2 includes the same set of covariates of the main Model, in addition to dummies of the five great regions of Brazil: The Northeast, North, Southeast, South and Center-West regions (See Table 2, page 78, for the description of these covariates). Balancing the treatment and the control

group across these covariates is important due to the vast cultural and socio economic differences across Brazilian regions.<sup>47</sup>

### ***Comparison of Treatment Effects across Methods***

This study performs two robustness checks to examine the validity of the results obtained from the Propensity Score Matching methods. The Treatment Effects obtained from linear regressions<sup>48</sup> using the same sample of treatment and control across all subgroups; on the same set of covariates used for the main model. For the dichotomous variables, the study uses a Probit model, and OLS regressions for the categorical variables on the risky behaviors outcomes (use of Frequency of the use of contraceptives, cigarettes, alcohol and the use of drugs). These results with a matching method called Inverse Probability of Treatment Weighting (IPTW). This method is basically a linear regression that uses weights obtained from a *pscore* calculation (the same used to obtain the balance in the Propensity Score Matching). The process unfolds as follows: First the *pscore* is calculated using the same set of independent variables without the outcome as in the main model. Using the obtained *pscore*, weights are created so that the control group looks like the treatment group. Finally, this study performs a the linear regression using the weights obtained from the *pscore* calculation, on the same set of schooling, labor and risky behavior outcomes already mentioned. Weights:

$$(1) \text{Weights Control} = e(x) / [1 - e(x)] Y = \alpha + \beta (\text{TREAT}) + \beta_k x_k + u \text{ [Weighted]}$$

where the weight of the control equals to  $pscore / (1 - pscore)$ , and the weight of the treatment = 1. Equation (1) measures the effect of the treatment on school dropouts and controlling for other regional, demographic and social characteristics. One of the advantages of this second method over the Propensity Score Matching is that the weighting can be more efficient and

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<sup>47</sup> See Chapter 2, for more details and Tables in Appendix B.

<sup>48</sup> For all outcomes except for the frequency of the use of contraceptives, alcohol, cigarettes and drugs I use a Probit model since these are dichotomous dependent variables. For wage outcomes I use an OLS regression.

more stable in cases when the comparison group, in this case the non-beneficiaries of the YAP, 495, is smaller than the treatment group, 1688, the program beneficiaries. Furthermore, this model requires fewer distributional assumptions about the underlying data. In order to make causal inferences, this model has to fulfill like any other linear regression, the linear function form assumption (Gellman & Hill, 2009).

### **Summary**

For the empirical, this study uses the 2006 *Projeto Agente Jovem* dataset, administered to 2,210 households and representative of the recipients of the Young Agent Project across regions, states, genders and racial composition. Because the Young Agent Project was not randomized, this research uses Propensity Score Matching techniques, (Average Treatment Effect of the Treated, Nearest Neighbor with Replacement) designed to correct for the possible selection bias. The results of this dissertation were divided into three chapters. First, “How the time is allocated matters,” makes an analysis of the effect of the YAP on schooling, labor and risky behaviors, looking at the differential treatment effects by gender, age, ethnicity and region. The second part, “Who receives the transfer matters,” focuses on the effects of schooling, labor and risky behaviors when transferring the conditional cash to parents or directly to the adolescent beneficiary. The third part, “The amount of time allocated to the after school program matters,” studies how the amount of weekly hours dedicated to structured leisure during the after school program can have differential impacts on schooling, labor and risky behavior outcomes. The last section of this chapter is called, “Is Propensity Score Matching, correcting the selection bias into the YAP?”. It discusses issues of endogeneity, the role of unobservable characteristics on the selection into the YAP and shows the results from the sensitivity analysis and the comparison of treatment effects across other methods.

## CHAPTER 6.

### HOW TIME IS ALLOCATED MATTERS

The way that adolescents allocate their time has important implications for their education attainment, college aspirations, job opportunities and future earnings. The Young Agent Project (YAP), with a transfer conditional on schooling and after school program attendance, structures adolescent time allocation increasing the time that adolescents put into schooling and to enriching structured leisure in the After School Program. The cash transfer reduces at least partially the opportunity cost to attend school as well as the after school program.

This chapter studies the effects of the YAP on schooling, labor and risky behaviors, using the total sample, that includes 2180 observations with a treatment group of 1688 and control group of 495 adolescents. In addition, because Propensity Score Matching does not allow seeing the effect of the program by gender (only balance the treatment and the control group across the chosen covariates), this study performed gender, ethnic and regional subgroup analysis. For the gender subgroup analysis, this research compared the treatment effects across females (N=1126) and males (N=1056). In Brazil, ethnic differences are important determinants of schooling outcome, which is why this study also created an ethnic subgroup analysis of whites (N=520), *Pardos*<sup>49</sup> (N=1005) and Pretos/Black (N=485). Furthermore, due to the strong socio-economic and cultural differences among regions, this research also performed a comparison of treatment effects between the Northeast region (N=579) and the Southeast region (N=972). Finally, this chapter performed an age-grade delay analysis among 17 year-olds (N =656) and 18 year-old only (N=833) (See Tables 1 and 2 in Chapter 5 and Appendix D, for more detail about the samples).

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<sup>49</sup> The category *Pardos* refers to a Brazilian ethnic category that accounts for approximately 43 percent of the total population. *Pardos* are people that self-identified as mixed between white and black, white and indigenous, or white, black and indigenous (IBGE/ 2010 Census).

Tables 4 to 8 (page 112) report the causal estimates obtained from Propensity Score Matching Methods using the Average Treatment Effect on the Treated (ATT). All standard errors for the matching results were bootstrapped 1,000 times. All models met the balancing criterion that the treatment and control groups did not differ in terms of covariates to calculate the propensity scores (See Appendix F for balance and histograms). In the first section of this chapter, I study the effects on schooling, labor and risky behaviors with the total sample and subsamples by gender, ethnicity and regions. In the second section, I will discuss the results of this chapter.

### **What is the effect of the Young Agent Project on schooling outcomes and youth labor decisions?**

YAP participants have better schooling outcomes, particularly for females, *Pardos* and the young from the Southeast region. Table 4 shows the causal estimates from the total sample and the gender subgroup analysis. Former program beneficiaries are 14 percent more likely to have completed middle school than their counterfactuals and this effect is significant at the 1 percent level. The gender subgroup analysis in Table 4 suggests very similar middle school completing effects among men and women. Instead, with regards to ethnicity, Table 5 shows that *Pardos* and Black/Pretos former program participants are 17 percent more likely than their counterparts from the same ethnic group (*Pardos* and Blacks) to have completed middle school. While these two ethnicities obtained coefficients significant at the 1 percent level, no significance was obtained for whites. The program also enjoyed different effects by region. While the effect on middle school completion for former program participants from the Northeast region was 11 percent, in the Southeast region it was 13 percent. The effects were significant at the 10 percent and 1 percent level, respectively.



What is then the effect of the program in high school completion<sup>50</sup>? Based on the total sample and the gender subsample, no effects were seen for high school completion. Instead, when looking at different ethnic groups, *Pardos*, aged 18 to 20 that benefited from the program are 10 percent more likely to have completed high school with regards to the control group, and the coefficients are statistically significant at the 1 percent level. As expected, high school completion was higher in the Southeast region. While young former beneficiaries living in the Northeast showed a 10 percent higher likelihood, young from the Southeast portrayed a 25 percent higher likelihood when compared to their counterfactuals in the respective regions. Both coefficients are significant at the 10 percent range only.

Regarding educational aspirations, no differences were found between the treatment and the control group when using the total sample<sup>51</sup>. When looking at the gender subsample, females who participated in the program are 8 percent more likely to have aspirations to attend college than those who did not. No significant effect was found for males. Interestingly, despite a positive effect on middle and high school completion, black former participants are 15 percent more likely to have college aspirations than those who did not participate. No other coefficient had significant results on this outcome and the coefficients among the other groups were negative. Regional differences are also observed in this outcome. Only those that benefited from the program in the Southeast region had a significant effect of 13 percent. While this effect is significant at the 5 percent level, no differences were found among those from the Northeast and their counterfactuals in the same region.

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<sup>50</sup> In Brazil, the average age of expected high school completion is 17 and the fact that this survey was done in September near the end of the school year. For this analysis, 916 adolescents aged 16 and 17 were excluded from the sample since they are not expected to have finished high school by that age. For more information about Brazilian educational system see Chapter 2.

<sup>51</sup> Due to the small sample size of the subgroup analysis and consequently the large standard errors, this study did not perform a Chow Test to compare whether the differences across coefficients were significantly different from each other. With large standard errors it is not likely to find significant differences using Chow Test.

Overall, former beneficiaries have better middle and in some cases high school completion rates and greater aspirations to attend college than their counterfactuals. Nevertheless, because the sample includes young aged 16 to 20, these might still be delayed with respect to the average age grade or graduation age in Brazil. Table 6 shows that 17 and 18-year-olds that benefited from the YAP are strongly delayed for the average grade and that the program did not decrease the age grade delays. No significant effects were found among 17-year-olds on middle school, sophomore year, junior year or high school completion. In the case of junior year or high school completion the coefficients were not significant. Instead, 18-year-olds were 10 percent more likely than the control group aged 18 to have completed middle school. This effect is only statistically significant at the 10 percent level. There were not significant differences among the treatment and control group on the sophomore or junior year, or on high school completion. High school completion' coefficients were negative. Looking at the large standard errors one could assume that with a bigger sample, this effect would be significant suggesting a negative effect of the program on age grade delays.

Working while studying can affect school performance and school attendance, retarding students from their high school completion. As explained in Chapter 5 Methods, this study assume that adolescents make decisions on time allocation (other than leisure) in four different ways: 1) Specialization in school, 2) Combination of study and work, 3) Specialization in labor, and 4) Inactivity or idleness.

Consistent with the predictions from the theoretical model, low income adolescents that benefited from the program are more likely to combine labor and school instead of specializing solely in work or in school. The program even caused reductions in the likelihood of only studying and reduced idleness among former program participants. Based on the total sample (Table 4) the program had a 5 percent reduction in the likelihood of being only studying and this coefficient is significant at the 10 percent level. No significant effects

were found among the gender subgroups. The higher standard errors and the fact that the total sample was significant and that the males and females' were not, suggest that the lack of significance can be due to the lower amount of observations when dividing the samples. Regarding differences among ethnic groups in Table 5, *Pardos* and Blacks showed an 18 and 17 percent respectively higher likelihood of having completed middle school. Both coefficients were significant at the 1 percent level. But non-significance differences were seen among whites and their counterfactuals. Regions also show different effects in Table 5. Former beneficiaries from the Northeast region are 11 percent less likely to be only studying than when compared to their counterfactuals. While this effect is significant at the 10 percent level, no significant effects were observed among the Northeast region.

As seen in Table 4, adolescents and young adults that benefited from the Young Agent Program are 12 percent more likely to combine work and study than the control group. This effect is stronger for males (14 percent) than for females (9 percent). All coefficients are significant at the 1 percent level. Regarding differences among ethnic groups, white and black former participants showed a higher likelihood to be working and studying at the same time. This effect was 11 percent and significant at the 10 percent level in the case of whites, and 10 percent and significant at the 10 percent level in the case of blacks. No significant effects were observed between former *Pardo* beneficiaries and their counterfactuals. Interestingly, former program beneficiaries from the Northeast are almost twice as likely as those from the Southeast to combine work and study. While the effect is 14 percent and significant at the 5 percent level in the Southeast region, it is 6 percent and only significant at the 10 percent level in the Northeast region.

Consistent with the hypothesis that former participants are more likely to combine work and study, the program had some reductions in the likelihood of being only working. Table 4, displays females while showing no significant effects on the total sample. Instead,

former male participants show a 7 percent lower likelihood of being only working than when compared to the control group. This coefficient is significant at the 10 percent level. No significant effects were found among ethnic groups. Former program beneficiaries from the Northeast also showed a small reduction of 1 percent of the likelihood of being only working. Adolescents and young adults from the Southeast regions did not show significant differences with their counterfactuals.

The YAP participants had strong reductions across all gender, ethnic and regions on idleness (adolescents not working and not studying). For example, when looking at the total sample in Table 4, former program participants had a 5 percent reduction on the likelihood of being not working and not studying and it is significant at the 15 percent level. Females had a stronger reduction in idleness (9 percent) than males (4 percent). Both coefficients are significant at the 1 and 10 percent level, respectively. Stronger reductions of idleness were also observed among *Pardos* (10 percent) and Blacks (11 percent). Both coefficients were significant at the 1 and 5 percent level, respectively. No significant effects on idleness were observed among whites. While both regions had negative coefficients, only the treatment group in the Southeast region showed a 6 percent lower likelihood of idleness. This effect is significant at the 10 percent level and no significance was obtained for the Northeast region. Finally, young adults in the treatment group seem to be as likely as non-program beneficiaries to have informal jobs. No significant effects were observed in the total sample, in the gender subgroup analysis or among the North and the Southeast regions. When looking at the different ethnic groups, only *Pardos* showed an 11 percent lower likelihood of having a formal job. This effect is significant at the 5 percent level.

YAP participants have better schooling outcomes, but present age grade delays, are more likely to be working and studying at the same time and less likely to be idle. Furthermore, higher education attainment does not seem to be reflected the likelihood of

having a formal job. These results suggests that although the program did not reduce the likelihood of working or working while studying, it makes young adults more motivated to be productive working and studying and being less prone to the inactive. Furthermore, if we take into account that due to personal and household income constraints, former participants often do not have the choice not to work, combining work and study shows instead the will and motivation to attain something higher.

### **What is the effect of the Young Agent Project in Risky Behavior Outcomes?**

This section studies the effect of the YAP on risky behaviors such as the use of contraceptive methods, teen pregnancy, the frequency of cigarette smoking, the frequency of drinking alcohol and using drugs. Tables 13 and 14, report the impact of the YAP on risky behaviors. Columns 1-3 present the results from the whole sample, columns 4-6 represent female subgroup results and columns 7-9 males subgroup results. Strong improvements on the use of contraceptive methods and reductions on the frequency that adolescents smoke cigarettes, with mixed effects depending on the subgroups were observed.

Based on the total sample, former program participants are 19 percent more likely to always to almost always use contraceptive methods. This effect is significant at the 5 percent level. This effect is 24 percent for women and 19 percent for men and significant in both cases at the 10 percent level. Regarding ages, the subgroup 16 to 17 had a positive but lower effect of 22 percent than the age group 18 to 20, with an effect of 29 percent. This effect differed across ethnic groups, with whites showing the larger increase of 57 percent on the frequency they used preservatives. No significant effects were obtained for former participants *Pardos* or Blacks. Only adolescents from the Southeast region showed a significant improvement on the use of contraceptive methods of 38 percent. This coefficient is significant at the 1 percent level. A positive but not significant effect was obtained for the Northeast region.

Self-reported improvements on the frequency that adolescents use contraceptives were not translated necessarily into reductions of teen pregnancy<sup>52</sup>. Only former program participants aged 16 to 17 showed a significant reduction of 7 percent on the likelihood of getting pregnant. However, there were stronger reductions on the likelihood of having unplanned pregnancies. Based on the total sample, former program participants were 4 percent less likely to have an unplanned pregnancy and this is significant at the 1 percent level. This reduction was 4 percent for females and 5 percent for the age group 18 to 20. Regarding ethnic groups, only *Pardos* showed significant reductions of 6 percent on the likelihood of having an unplanned pregnancy with respect to the control group. While this effect is significant at the 5 percent level, positive but not significant coefficients were obtained for both Whites and Blacks/Pretos. No significance differences were observed among young in the Northeast and Southeast regions and their respective controls.

Regarding smoking, based on the total sample, former program beneficiaries are 16 percent less likely to be smoking every day when compared to the treatment group. The reduction was 6 percent higher for males (20 percent) than for females (14 percent). No significant effects were obtained for the age subsamples, but this can perhaps be explained by the higher standard errors given the smaller samples. Among the different ethnic groups, only Whites showed a 20 percent reduction on the frequency of smoking every day. This effect was only significant at the 10 percent level and no significant effects were observed among former participants *Pardos*, Blacks. As in previous outcomes, only former participants from the Southeast region had a significant reduction of 47 percent on the likelihood of smoking every day. While this effect is significant at the 1 percent level, the Northeast region had a negative reduction of 6 percent but without a significant effect.

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<sup>52</sup> Two variables were created: teen pregnancy and unplanned teen pregnancy. Making this distinction is important since pregnancies could be wanted by the adolescent. See Table 2, Chapter 5 Methods for more details about the differences of these variables.

Former program participants have a higher frequency of drinking than their counterfactuals. This likelihood is 23 percent for the total sample, 17 percent for females with no significant effects for males. It is important to take into account that some of these effects are related to different utility functions across ages based on peer pressure, the ability to buy alcohol when the law restricts it before the age of 18. Look at the differential effects by ages, it is possible to observe that while the age group 16 to 17 had a 30 percent higher likelihood than their counterfactuals to be drinking, the age group 18 to 20 did not have any significant difference with the control group. No significant effects were observed among individuals from the Northeast and Southeast regions and among ethnic groups.

Regarding the use of drugs at the moment of the survey this study observed small reductions. Based on the total, former program participants are 2 percent less likely be using drugs. This reduction was 1 percent for males with effects significant at the 10 percent level. No significant effects were observed among females and the age groups with respect to their counterfactuals. A 3 percent reduction of drugs consumption was also observed in the Southeast region.

### **Discussion: Exploring the Impact of the YAP on the Economics of Time Allocation**

Contrary to child labor theoretical frameworks, this study considers that adolescents from low-income families in developing countries acquire adult responsibilities very early in life and make their own decisions about how to allocate their time between leisure (or idleness), school and labor. The way adolescents allocate their time has important implications on their education attainment, risky behaviors, teen pregnancies, future jobs and earnings. Due to the short school day of 4 hours in Brazil and the flexibility to study in the morning, in the afternoon or at night,<sup>53</sup> Brazilian youth could easily accommodate school and

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<sup>53</sup> In some states such as Rio de Janeiro, high school courses are offered exclusively at night.

labor or have extensive periods of unsupervised leisure time in which they might gravitate to risky behaviors.

Former program participants are more likely to have completed middle and in some cases high school, more likely to combine school and work and less likely to be idle. These estimates indicate a complex relationship between study and work. Contrary to traditional child labor theoretical frameworks, study and labor are not substitutes but complements. In order to continue studying, adolescents need to work to pay for their personal expenses, school supplies and transportation, while helping at home.

The effects of the program could be explained by an income effect caused by the amount of the transfer and by a pseudo-substitution effect caused by the program conditionality. The subsidy of \$30 US per month transferred by the YAP partially reduces the opportunity cost to attend school and the after school program allowing adolescents to make different decisions about the time allocated to leisure, to study, to work or to do nothing at all. There seems to be a pseudo income effect or a price effect that decreases the direct costs of schooling (tuition fees, transportation, books or others), and increases consumption of all normal goods, namely of leisure and consumption. Thus, this income effect allows program beneficiaries to work fewer hours and to allocate more time to school and the after school program. Working many hours per week or during commercial seasons (Christmas, Mother's Day, Saint John's Day) can affect attendance and increase absenteeism, ultimately increasing grade retention and thus age grade delays.

Secondly, the program attendance conditionality of the YAP creates a time constraint, in which program participants must allocate 4 hours to school and 4 hours per day to structured activities in the after school program. These activities include conferences and courses, sports, arts, theater, cultural trips and health talks. Altogether, the time allocated to school and to the after school program (8 hours) is the equivalent to the duration of the day of



most private schools in Brazil. The new time allocation reduces the amount of time adolescents have available to dedicate to work, to do nothing or to engage in risky behaviors during unsupervised leisure time, thus creating a substitution effect. This additional time in school is translated into lower repetition rates, lower absenteeism and ultimately higher school completion rates.

Nevertheless, due to age and to legal and labor market factors, the amount of the subsidy might not be enough to replace the foregone income from the labor market. In Brazil after the age of 14, adolescents are legally able to work (obtain a *Carteira Assinada*) and have the physical capabilities to perform heavier duties than younger children. Attending the after school program might increase the opportunity cost, since the overall salary in the labor market can be higher than the amount of the transfer. That is why adolescents might need to combine schooling with some hours of labor by serving the minimum attendance conditionality. Although the transfer is supposed to replace part or all of the salary of the adolescent, it does reduce the amount of hours they might need to work to attain a certain level of income, which would allow them to more easily combine study and work instead of dropping out of school indefinitely. Furthermore, combining work and study is not necessarily a negative effect of the program. While due to credit constraints (lack of support from their families) adolescents need to work, the fact that they do not drop out of school shows that they have the motivation, the discipline and the endurance to achieve higher levels of education and improve their future earnings. This effect is particularly encouraging due to the immense job opportunities available in Brazil as a result of the strong economic growth of the last decade (6 to 8 percent from 2005 to 2010)<sup>54</sup>. Durkea and Arend-Huenning (2003) suggest that children 14 to 16 in Brazil are more likely to leave school as local market

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<sup>54</sup> IBGE (Instituto Brasileiro de Geografia e Estatística) See [http://www.ibge.gov.br/home/mapa\\_site/mapa\\_site.php#economia](http://www.ibge.gov.br/home/mapa_site/mapa_site.php#economia)

conditions become more favorable. They found that macroeconomic fluctuations are stronger determinants of children employment than family income.

Despite improvements in education attainment, former program participants did not show significant differences in the likelihood of having a formal job. All coefficients were negative and *Pardos* even showed a negative reduction of 11 percent on the likelihood of having a formal job. It is possible that with a larger sample and greater statistical power, most of these coefficients would have been significant, implying overall reductions of job formality. One of the possible explanations of this effect is that it is easier to combine work and study when in an informal job. A formal job that occupies at least 8 hours of the day of the adolescent or young adult would not give enough flexibility to combine work with study. Appendix A, shows the types of jobs that were performed by adolescents and young adults in the sample.

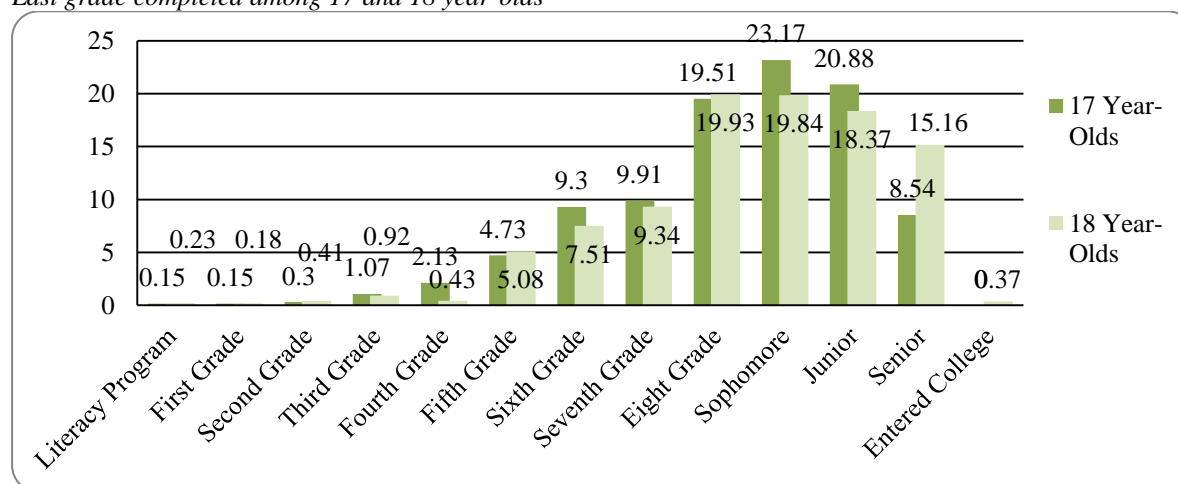
Program participation, combined with labor, can improve certain soft skills highly valued in the labor market such as time management, reliance, problem solving, and the ability to follow directions, teamwork and communication. It can also improve values such as responsibility and discipline. Of course, the extent to which these values and soft skills are developed depend on the type of jobs adolescents and young adults are performing while studying. For example, former participants combining study with work at a restaurant might develop a better client service skill, while someone involved in a more managerial position (e.g. helping his/her parents to sell shoes) might further develop problem solving skills.

Combining work and study might come at the expense of pushing back the age of graduation. Results from this study indicate that the program did not reduce the likelihood of being delayed with respect to the average age grade. This could be explained by a negative effect on the number of hours worked per week, or during commercial seasons (Christmas, Mother's Day, Saint John's Day) that can affect attendance and increase absenteeism,

ultimately increasing grade retention and thus grade overage. Indeed, other studies have also accounted for the interdependence of working and studying, which, when taken simultaneously, can increase age grade delays by rising absenteeism or creating poor school performance caused (Beegle et al., 2004). Nevertheless, it is important to take into account that this is not necessarily a program effect and that many former beneficiaries were already very late with regards to the average class age before joining the program. The YAP could potentially stop from dropping out of school only those adolescents that were already the average class age before the program. Furthermore, since in many cases only youth at risk are supposed to be recruited, these results could also be explained by a negative self-selection into the program. Youth at risk of dropping out of school due to an extreme grade age delay, or simply out of school, can also be recruited into the program.<sup>55</sup> Graph 2 shows for example that only 29,42 percent of the total sample aged 17, and 15,33 of those aged 18, are on the correct age-grade level after the program of having completed junior year of high school.

Figure 4

*Last grade completed among 17 and 18 year-olds*



Source: Author's own elaboration using the Projeto Agente Jovem Dataset.

Since the YAP lasted for approximately 2 years, the challenge was probably to keep on track some of those that after the survey had completed their sophomore year and perhaps

<sup>55</sup> This possible negative self-selection will be discussed later on the sensitivity analysis and comparison of different treatment methods to correct for selection bias.

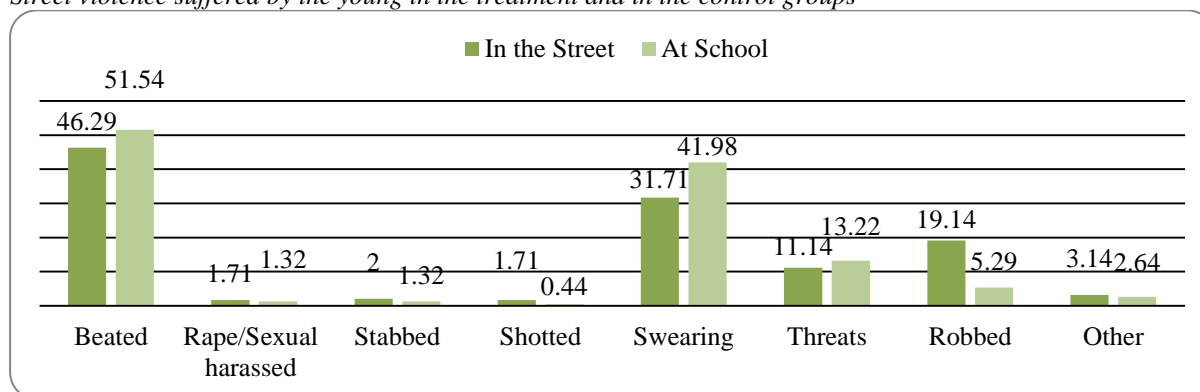
those that had completed eighth grade. Adolescents who were in grades lower than the eighth grade, were already far behind the average class age no matter how effective the YAP was at keeping students in school, improving and completing grades. Age grade delays can thus be explained in part by late school starting age, grade retention, low school performance, pregnancies and in the case of Brazilian *Favelas*, being exposed to violence. For example, Patrinos and Psacharopoulos (1996) suggest that poorer families with more children start late and/or repeat grades because of the need for child labor or because older children, particularly girls, might have to help their mothers to care for the young. Another reason for school grade overage due to dropouts or absenteeism is the role of violence in most *Favelas* or slums in Brazil (Soares et al., 2009). A study done by the secretary of education of Rio de Janeiro (Prefeitura de Rio de Janeiro)<sup>56</sup> found that school dropouts were significantly higher in *Favelas* controlled by drug traffickers or recently pacified *Favelas*, 5.1 percent vs. 2.6 in other *Favelas* or low-income neighborhoods. As seen in Graph 2, 16 percent of the young in control and treatment groups from the YAP survey reported having been victims in the past of violence in the street and 10 percent at school. Forty-six percent of the young individuals that reported having been victims of violence attested to having been beaten in the street and 51.5 percent at school. Another 31.71 percent were victims of swearing at school and 41.98 in the street. In addition 19.14 percent were robbed in the street and 5.29 percent were robbed at school. A total of 11.14 percent received threats in the streets and 13.22 percent received threats at school. It might seem like a small percentage, but a total of 2 percent were stabbed or shot in the street and 1.32 percent was stabbed in the street. Violence in the streets and at school can be then associated to school dropouts and grade age delays.

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<sup>56</sup> For more details about the Escola da Amanhã, see: <http://www.rio.rj.gov.br/web/sme/exibeconteudo?article-id=2281501>

Figure 5

*Street violence suffered by the young in the treatment and in the control groups*



Source: Author's own elaboration using the Projeto Agente Jovem Dataset.

Strong reductions on the likelihood of being idle after the end of the program suggest that the new time allocation dynamics of the program changed adolescents' motivations, aspirations, and opened new opportunities in the labor market due to higher education attainment or even thanks to new connections from peers in the program. Idleness is often explained in studies by factors such as extreme poverty, lack of labor opportunities for children locally or because the school is not sufficiently close to home (Cigno, Rosati & Tzannatos, 2003). Another study about the effect of the number of hours worked by children in Nicaragua and Pakistan suggests that an increase in income reduces the number of hours children need to work, and that the effect is stronger for children that are not in school either only working or doing nothing (Rosati & Rossi, 2003). In another study about school dropout factors in the Northeast of Brazil, Cardoso and Verner (2006) concluded that, particularly in an urban context, working does not necessarily have a detrimental effect on school attendance, and that dropping out of school leads most often to inactivity. They suggest instead that other forces such as teen pregnancy, lack of opportunities, extreme poverty or the use of drugs are driving young out of school into idleness.<sup>57</sup>

<sup>57</sup> It is nevertheless important to be cautious with these results since they could be magnified by the complexity of what "idle" might mean to parents and adolescents when the question is asked (Cigno, Rosati & Tzannatos, 2003). The Young Agent Project survey asked what the adolescent was doing by September 2006. Since the school year starts in February, idleness could then be in reality a transition process from study to work or vice versa, or could reflect an illness or even a disability.

The results obtained on the effect of the program with risky behaviors are consistent with these reductions on idleness. Evidence from this study shows an increased use of contraceptives, reductions on the likelihood of unplanned pregnancy and a lower frequency of cigarette smoking and in some cases drug use for former beneficiaries. As discussed in the theoretical framework, adolescents maximize their utility function based on the consumption of goods such as Status, which can be given by money or can have a symbolic value (status, belonging to a community, acceptance among peers and sensation seeking). Furthermore, adolescents' decision-making process gives a higher weight to the utility of an activity in the present (such as status and sensation seeking that could lead to risky behaviors) than to the long-run implications of pursuing risky activities (Gruber, 2001).

The new time allocation structured by the YAP may play an important role on reducing risky behaviors among adolescents because it changes what gives status at school or with the after school program new community. First, the schooling attendance conditionality of the YAP reduces the amount of unsupervised leisure, and therefore restricts the time they have available to socialize with peers in the *Favela* and among idle youth. The program participation may reduce thus the neighborhood effect or the negative peer effect where status is determined often by the consumption of risky behaviors such as smoking cigarettes, using drugs or engaging in risky sexual intercourse. While adolescents still give a symbolic value to belonging to a community and being accepted among peers, the new community in the after school program values instead school achievement (or at least attendance), combining school and work in order to be someone in life (*Ser alguém na vida*).<sup>58</sup>

Secondly, it can be inferred that, reductions in risky behaviors may be caused by the fact that adolescents are giving a higher value to the future than to the present. Better schooling outcomes expressed in education attainment and college aspirations give a real

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<sup>58</sup> This is an expression widely used in Brazil. *Ser alguém na vida* means to achieve success in life by getting a good education and a decent job.

expectation of better opportunities in the future. Portes and Rumbaut (2001) suggest for example that only the availability of real and concrete opportunities such as scholarships, loans and affirmative action programs create real educational expectations among the young. Furthermore, Fishoff (1992) suggests, for example, that higher school attainment improves the capacity of adolescents to think through problems; attaining knowledge of behaviors and their implications, and skills in carrying out analyses of the alternatives, such as critical thinking skills. In this sense, better schooling outcomes are also related to the reduction of some risky behaviors by making adolescents believe in the possibility of a better future. Adolescent decision-making processes previously consisting of a higher present value can be transformed into a major awareness of the costs of the risky behaviors and sensation seeking today (e.g., drug use or risky sexual behaviors) vs. the long-run more plausible opportunities at college or of higher earnings in the labor market (Gruber, 2001).

The stronger value given over to consequences, actions of the present determining our future, can also be a result of the reduction of the neighborhood effect and the exposure to violence in the *Favelas*. Indeed, studies suggest that risky behaviors are increased in youth that anticipate a high likelihood of an early death (Borowsky et al., 2007). This is particularly common in the life context of children and youth living in deprived communities where violence, murders and drug micro traffic is very common, such as in Brazilian *Favelas* where criminality and murder rates rise sharply. As discussed earlier, 16 percent of the young in control and treatment groups reported having been victims of violence in the street, with 10 percent being at school. Borowsky et al. (2007) found for example that a 50/50 perceived early mortality predicted serious health outcomes, most profoundly a diagnosis of HIV/AIDS in young adulthood as well as other health conditions. This study found strong differences in perceived risk for early mortality between social groups. Indeed, males, urban youth, youth in minority racial or ethnic groups, families who received public assistance and those who lived

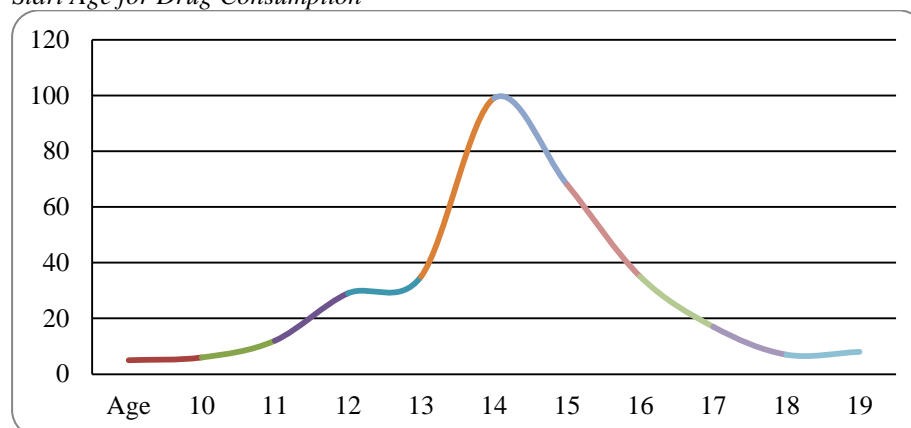
without both biological parents have a significantly higher perceived risk of early death with therefore more chances to get involved in risky behaviors (Millstein, 2002; Borowsky et al., 2007). In another study, Duke et al. (2011) used regression models to determine the contexts of healthy and unhealthy change associated with the likelihood of early death perception. Adolescents that reported an increased caring and connection to other adults and increased self-esteem presented a greater likelihood of moving from pessimism to optimism about life expectancy while reducing risky behaviors.

The decision to engage in risky behaviors also differs by age. Evidence from this study showed that the age group 18 to 19 had a higher use of contraceptives than those in the age group 16 to 17. Furthermore, while those aged 16 and 17 showed an increased likelihood of having a teen pregnancy, the age group 18 to 20 showed reductions on the likelihood of unplanned pregnancy. The younger group was also the only one with a higher frequency in use of alcohol than the control group. A different utility maximization process determined by participant age could explain these results. Adolescents aged 16 and 17 might give an even stronger value to the present, to status, to acceptance among peers and particularly to sensation seeking than those aged 18 to 20 would seek. Indeed, studies suggest that adolescents' developmental windows of vulnerability are intensified by ongoing changes in the brain according to their age. Descriptive information from the YAP survey in Graph 4 shows that youth ages 18 to 20 should be expected to have lower risk preference than those aged 16 to 17.



Figure 6

*Start Age for Drug Consumption*



Source: Author's own elaboration using the *Projeto Agente Jovem* Dataset.

This evidence is consistent with evidence from behavioral experiments and magnetic resonance imaging (MRI) of the brain in neuroscience suggest that risk-taking behaviors reach their peak between the ages of 14 to 17 and start declining by the age of 18 (Casey et al., 2007).

### ***On the Relationship between Schooling, Labor and Pregnancy among Women***

In Brazil, inequality and poverty tend to hit men and women differently, along with people from different ethnic groups, racial groups and regions. More women from African descent live in the poorer regions (the Northeast and Northern regions) and are more heavily affected by school dropouts, job informality and pregnancy during adolescence. This could explain why, despite the fact that the YAP is federally funded, the program had differential effects by gender, ethnicity and regions. Former female Young Agent beneficiaries have higher educational aspirations and a higher coefficient in middle and high school completion than males. They are also less likely to combine work and study and show higher reductions in the likelihood of being idle. Although due to the sample size of this survey, this subsample analysis could not further create samples by gender and region, Table G1 of Appendix G of the Sensitivity Analysis suggests that when balancing the sample by regions, all coefficients of schooling and labor outcomes are 2 to 3 percent lower than with the main model.

How to explain these higher gains for females? First, unlike other Latin American countries with large indigenous populations, females in urban Brazilian low-income households have higher number of years of schooling (14.3) than males (13.6) (See Graph B7 in Appendix B). Given the higher education attainment of females at the baseline, the effects obtained for middle school (0.197) and high school (0.113) attainment are very high. Higher schooling gains for females than for males are consistent with evidence from the effects of *Bolsa Familia* in Brazil. Studies show that dropouts decreased, particularly for girls in the Northern and Central region and for boys in the Southeastern region. The study also shows that boys' school dropout rates in the treatment group seemed to increase in the Northern and Central regions (Cardoso & Souza, 2004; De Oliveira et al., 2007).

Secondly, higher schooling outcomes for females could be explained by the fact that they are pressured less than males to start working from an early age and are also less likely to engage in risky behaviors such as drinking alcohol, consuming drugs and getting involved in drug trafficking within the *Favelas*. Nevertheless, females have more responsibilities and carry often the sole responsibility of the baby. That is why females are more affected than males in the cases of pregnancy during adolescence, which can lead to school dropouts and idleness. Indeed, former female beneficiaries got greater reductions than males on the likelihood of idleness and greater gains on combining school and work. It is important to take into account that oftentimes studies of work participation of women do not take into consideration domestic duties that are more likely to be performed by females. Tasks such as taking care of an elderly family member, younger siblings or cleaning are often not included in surveys. These results would suggest that those females that were taking care of family members (and were in the category of "doing nothing") went back to study and work during and after the program. Future surveys dealing with labor participation of women should

include precise questions about the nature of the “not working activity”, the number of hours they dedicate to domestic duties taking care of children or family members.

This study found evidence that schooling, labor and risky behaviors are almost mutually exclusive, particularly in the case of females. Higher school gains are consistent with positive improvements on the use of contraceptives among females in the treatment group and with reductions in the likelihood of having an unplanned pregnancy. One plausible explanation is that because adolescents are very sensitive to change in prices, the transfer reduces the income effect of buying contraceptives (Gutierrez, 2007). Otherwise, with none or very low income, many adolescents cannot afford the cost of contraceptives or the transportation to go to free clinics to get them for free. Studies about reproductive health in Brazil have also found positive effects of being active in the labor market and access to information about reproductive and sexual health free services provided by the government. Furthermore, the study found that access to information and contraceptive methods depends on the age of the partners. Girls with older partners had higher access to information about these health services (Carvacho et al., 2008). Finally, this effect could also be explained by the exposure to health talks and courses about sexuality provided in the After School Program.

The gains in the use of contraceptives among females are consistent with the small but significant reduction of 2 percent in the likelihood of having an unplanned pregnancy during female’s adolescence. Studies have shown that greater educational attainment increases girls’ educational aspirations and postpones their first sexual experience, the age of marriage and/or first pregnancy (Gutiérrez, 2007; Baird et al., 2009; Galarraga & Gertler, 2009). Nevertheless, perhaps the most interesting results among sexual behaviors of former participants is that pregnancy is not necessarily a result of irresponsible sexual behavior or lack of information of contraceptive methods among adolescents. This study brings to the

debate the fact that many female (and male) adolescents want to have a baby. Indeed, the higher use of contraceptives was translated with significant reductions of unplanned pregnancies, not on overall pregnancies. How to explain the phenomenon? As elaborated on previously, adolescents give a high symbolic value to status and belonging to a community. In their decision-making process they give a higher consideration to the utility of an activity in the present than to the long-run implications (Gruber, 2001). Studies in poor urban areas of Brazil have shown that motherhood is a very important component of the status of a woman. When becoming a mother, girls are then seen as independent adult women, with responsibilities and a certain power within the household and community. Not only does being a mother give status, but it can protect girls from being victims of violence and traffickers in the *Favelas*; by dating the traffickers, or by being respected due to their pregnancy and motherhood. Planned pregnancies during adolescence are also a result of the normalization of teen pregnancy since their mothers, siblings, neighbors and classmates are also getting pregnant. For example, a total of 10 percent of all pregnancies in the Northern region were among girls aged 12 to 15 (IBGE, 2011). In that sense, being pregnant during adolescence becomes normal. Finally, evidence also suggests that a wanted pregnancy among females is associated with having a partner of an older age. Girls dating older partners might be more likely to get pregnant in order to be allowed by the parents to move in with boyfriends (Carvacho et al., 2008). Despite this wanted pregnancy phenomenon, studies in Brazil have shown an increasing involvement of the father on the support of their children in comparison with former generations, when children were raised mainly by mothers and grandmothers (Dias & Aquino, 2006). There seems to be a strong effect of unobservable psychological characteristics as a result of social norms rooted for many generations in the family and community that a two-year program cannot change so easily. Several generations with better opportunities at school and in the labor market are the only way to make a real

change in the status given by early motherhood, since for the moment communities characterized by inherited poverty, violence, and family role models continue to reproduce pregnancy during the adolescents as something normal.

Finally, with regard to other risky behaviors, females presented important reductions of the use of cigarettes, but no significant effects were observed in the use of drugs and a higher frequency in the use of alcohol. These results are consistent with the impact of PROGRESA *Oportunidades* in Mexico. Regarding alcohol consumption and smoking, the results in a longitudinal study using experimental methods (Gutierrez et al., 2005) demonstrated, that after nearly 6 years of program participation in rural areas, there was a 15 percentage point reduction of cigarette use for those aged 15–21, compared with control groups. To my knowledge, no other impact evaluations have studied the effects of alcohol, cigarettes, drug consumption and the differential impact of transferring the money directly to the adolescent.

It is also important to take into consideration that these results might be explained by a measurement error resulting from type of questions asked. The survey asked, for example, whether the adolescent had been pregnant, when and whether the pregnancy was planned (*A gravidez foi planejada?*). The problem is that many adolescents might not really understand what to plan means and whether planned is synonymous of “wanting to get pregnant”. In addition, if the survey was implemented to adolescents in the presence of their parents or relatives, they might have lied about the real cause or motives of the pregnancy.

Finally, an impact evaluation dealing with such a complexity would benefit from a series of in-depth interviews of parents and adolescents that explain the rational of female adolescents’ decisions on unprotected sex, wanting to get pregnant or not to work. Why for example, do some females stay at home taking care of elder relatives or younger children instead of studying or working. Do they even have a choice? How does daily violence in the

*Favelas* affect their futures? Why do some adolescents want to be pregnant at such an early age?

### **Summary**

The way adolescents spent their time matters. Evidence from this section shows that there is a positive impact of the program on schooling outcomes but with stronger gains for females, *Pardos*, Blacks and adolescents from the Southeast region. Former participants are more likely to combine work and study and less likely to be idle. This result may indicate that while due to necessity and credit constraints adolescents and young adults need to work, they are not dropping school definitively and continue studying but could be associated to age grade delays. Having higher levels of education do not result in a better working situation since former program participants did not present reductions in the likelihood of having an informal job. Regarding risky behaviors, this study found consistently positive improvements on the use of contraceptives among the treatment group. Although there were not reductions in teen pregnancy, the higher use of contraceptives is consistent with reductions in unplanned pregnancies among females and the 18 to 20-age subgroup. Interestingly, although the program had reductions in the frequency of smoking, and in some cases the use of drugs, it might have increased with the use of alcohol.

Table 4

*Schooling Outcomes – Total Sample and Gender Subgroup Analysis*

Outcome	All	Females	Males
Completed Middle School	0.137*** (0.035)	0.136*** (0.045)	0.135*** (0.055)
Completed High School	0.025 (0.039)	0.026 (0.039)	-0.041 (0.044)
Has College Aspirations	0.036 (0.036)	0.081** (0.047)	-0.002 (0.050)
Only Studying	-0.050* (0.034)	0.019 (0.044)	-0.031 (0.050)
Study and Work	0.120*** (0.037)	0.094*** (0.046)	0.141*** (0.053)
Only Working	-0.022 (0.031)	-0.021 (0.042)	-0.070* (0.048)
Idle (Not Working and Not Studying)	-0.047** (0.026)	-0.093*** (0.042)	-0.040* (0.032)
Formal Job (Carteira Assinada)	0.003 (0.049)	0.010 (0.069)	-0.076 (0.101)

Note \*Significant at 10%; \*\*significant at 5%; \*\*\* Significant at the 1% level. Each model is estimated using the same set of covariates. For the high school completion outcome young ages 16 or 17 were excluded from the sample since it would be normal that at that age they have not completed high school. Total sample N= 2183 and High School sample N= 1267. Models 1 -3 from the female subgroup N=1126 and High School sample N=638. Models 1 -3 from the Male subgroup N= 1057 and High School sample N= 629 .All PSM standard errors were bootstrapped 1000 times.

Table 5

*Schooling and Labor Outcomes - Ethnicity Subgroup Analysis*

Outcome	Ethnicity			Region	
	White	<i>Pardos</i>	Pretos (Black)	Northeast	Southeast
Completed Middle School	0.039 (0.064)	0.177*** (0.050)	0.173*** (0.076)	0.109* (0.072)	0.133*** (0.054)
Completed High School	0.076 (0.081)	0.099** (0.057)	0.077 (0.088)	0.100* (0.031)	0.246* (0.150)
Has College Aspirations	-0.013 (0.066)	-0.010 (0.050)	0.154** (0.079)	0.071 (0.071)	0.125** (0.060)
Only Studying	-0.066 (0.065)	0.025 (0.050)	0.021 (0.068)	-0.107* (0.069)	0.008 (0.118)
Study and Work	0.106** (0.061)	0.028 (0.062)	0.103* (0.073)	0.141** (0.067)	0.062* (0.055)
Only Working	-0.013 (0.059)	0.043 (0.045)	-0.010 (0.069)	-0.009** (0.062)	-0.102 (0.121)
Idle (Not Working and Not Studying)	-0.026 (0.046)	-0.097*** (0.041)	-0.113** (0.060)	-0.042 (0.040)	-0.057* (0.045)
Working with permit ( <i>Carteira Assinada</i> )	0.100 (0.093)	-0.113** (0.069)	0.105 (0.113)	-0.063 (0.105)	-0.073 (0.074)

Note \*Significant at 10%; \*\*significant at 5%; \*\*\* Significant at the 1% level. All PSM standard errors were bootstrapped 1000 times. Each outcome is estimated using the same set of covariates. The samples of having a formal job restricted to those that reported being working during the month of the survey. Total working sample N=1370, Whites N=520, working N=321. *Pardos* N=1005, working N=572, Pretos/black N=485 working N=316 Female subsample = 578. Working male subsample N= 750. Northeast N= 579 and High School sample N= 324. Southeast subsample N=972 and High School sample N=586. The Southern region, center-west and northern regions were not included in the analysis due to the small sample size.



Table 6

*Age-Grade Delay Analysis – 17 years old (N=656) and 18 years olds only (N=833)*

Outcome	17 years	18 years
Completed Middle School	0.047 (0.065)	0.099* (0.060)
Completed Sophomore Year in High School	-0.019 (0.073)	0.009 (0.264)
Completed Junior Year in High School	<b>-0.340</b> <b>(0.805)</b>	0.662 (0.764)
Completed High School <sup>59</sup>	–	<b>-0.025</b> <b>(0.053)</b>

Note \*Significant at 10%; \*\*significant at 5% \*\*\* significant at 1%. All results use bootstrapped standard errors. I excluded the models with regions due to the sample size and the low number of participants aged 17 and 18 in the southern and northern regions. Adolescents aged 16 were not included in this overage analysis due to the sample size N=260 generated very high standard errors results.

<sup>59</sup> Completed High School for the 17 year-olds sample could not be performed by Propensity Score Matching due to the sample size.

Table 7

*Risky Behaviors Analysis – Total Sample and Gender Subgroup Analysis*

Outcome	All	Gender		Age	
	Total Sample	Females	Males	16 to 17 Years	18 to 20 Years
Use of contraceptive methods	0.190** (0.089)	0.235* (0.145)	0.188* (0.105)	0.224* (0.185)	0.286** (0.116)
Teen/Young Pregnancy	-0.033 (0.026)	0.014 (0.044)	0.037 (0.027)	0.067*** (0.016)	-0.009 (0.041)
Unplanned Pregnancy	-0.039* (0.027)	-0.060* (0.043)	0.079 (0.109)	0.028 (0.001)	-0.048* (0.036)
Frequency smoking cigarettes	-0.160** (0.078)	-0.136* (0.110)	-0.196** (0.112)	-0.131 (0.104)	-0.094 (0.116)
Frequency drinking Alcohol	0.229** (0.115)	0.171* (0.089)	-0.014 (0.169)	0.297** (0.166)	-0.166 (0.161)
Currently Use Drugs	-0.018* (0.014)	-0.007 (0.014)	-0.010* (0.025)	-0.024 (0.022)	0.006 (0.019)

Note \*Significant at 10%; \*\*significant at 5%; \*\*\* Significant at the 1% level. All models estimated using the same set of covariates. All PSM standard errors were bootstrapped. Total sample N= 2183, control N=495 and treatment N=1688. Female sample subgroup N=1126, control N= 266 and treatment N=860. Male subgroup N= 1050, control N=229, treatment N=828. Age subgroup 18 to 20 N=1267, and use of contraceptives sample N= 936.

Table 8

*Schooling and Labor Outcomes - Ethnicity Subgroup Analysis*

Outcome	Ethnicity			Regions	
	White	<i>Pardos</i>	Pretos (Black)	Northeast region	Southeast region
Use of contraceptive methods	0.572*** (0.186)	-0.064 (0.121)	0.060 (0.174)	0.041 (0.154)	0.375*** (0.150)
Teen/Young Pregnancy	-0.013 (0.040)	-0.009 (0.039)	0.029 (0.056)	0.000 (0.046)	-0.004 (0.046)
Unplanned Pregnancy	0.029 (0.035)	-0.059** (0.040)	0.008 (0.058)	0.002 (0.044)	-0.026 (0.046)
Frequency smoking cigarettes	-0.198* (0.134)	-0.070 (0.107)	-0.010 (0.172)	-0.058 (0.131)	-0.464*** (0.131)
Frequency drinking Alcohol	0.092 (0.202)	0.132 (0.163)	0.307 (0.249)	-0.054 (0.217)	0.121 (0.174)
Currently of Drugs	-0.008 (0.024)	0.043 (0.045)	0.043 (0.045)	0.022 (0.023)	-0.033* (0.021)

Note \*Significant at 10%; \*\*significant at 5%; \*\*\* Significant at the 1% level. All PSM standard errors were bootstrapped 1000 times. Each Outcome is estimated using the same set of covariates. Whites N=520, working N=321. *Pardos* N=1005, working N=572, Pretos/black N=485 working N=316 Female subsample = 578. Working male subsample N= 750. Southeast regions N= 972, and use of contraceptives sample N= 660. Model 1 -2 for the Northeast regions N= 579, and use of contraceptives sample N=366

## CHAPTER 7.

### WHO RECEIVES THE CASH TRANSFER, MATTERS

Due to the age characteristic of program participants and the fact that many adolescents do not live with their parents, the YAP is flexible on transferring the cash to the adolescent or to the head of the household. As explained in Chapter 2, one of the special The first special features of the YAP is that the cash transfer can be received directly by the adolescent, their parents, the legal guardian or the head of the household. The decision to allow the transfer to go to the adolescent could be brought to bear by factors related to the age of the adolescent and to the family structure of the household. Information about the treatment group reveals that in 20 percent of the cases, adolescents were living with people other than their parents, including their grandparents, uncles/aunt, sibling and parents-in-law as heads of the households. In addition, in approximately 3 to 4 percent of the cases adolescents are independent from the household. Among that 75 percent that might live with the mother or the father, many might live with step fathers or step mothers. . If the cash transfer goes, for example, to a step mother that has other children, she would use that money on her own children instead of the beneficiary. The YAP cash transfer can be given directly to the adolescent, a legal guardian, family member or head of household.

Despite this transfer recipient flexibility, no matter who receives the transfer, adolescents are compelled to attend school and the YAP's After School Program. This chapter studies the differential effects of transferring the cash directly to the adolescent versus to the parents. For this aim, this study separated the treatment group into two groups: 1) adolescents that reported having received the transfer directly (N= 1262) and 2) adolescents that reported that the head of the household received the transfer (N=403)<sup>60</sup>. This

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<sup>60</sup> The question of the survey: Who receives the transfer of the program? (*Quem recebeu o dinheiro do Projeto Agente Jovem?*)

is possible to track since the YAP did not have any condition on who should receive the transfer<sup>61</sup>.

Tables 16 to 17 report the causal estimates obtained from Propensity Score Matching Methods using the Average Treatment Effect on the Treated (ATT). All standard errors for the matching results were bootstrapped 1,000 times. All models met the balancing criterion that the treatment and control groups did not differ in terms of covariates to calculate the propensity scores (See Appendix F for balance and histograms). This chapter starts by studying the effects by subsample on schooling, labor and risky behaviors, followed by a discussion of the results.

### **Is transferring cash directly to adolescents more effective in improving schooling, labor and outcomes?**

When transfers are given directly to the adolescent, schooling outcomes are better than when compared to those whose parents received the transfer as well as with the total sample. Table 9 shows for example that while adolescents that received the transfer directly are 22 percent more likely to have completed middle school, adolescents whose parents received the transfer do not show a statistically significant impact of the program. This lack of significance cannot be attributed to the smaller sample (N=898) of the Transfer to Parents subsample since standard errors remain similar to those in the Transfer to Adolescents subsample (N=1757). These results are consistent with high school completion rates among program participants. Adolescents that received the transfer directly are 5 percent more likely to have completed high school than their counterfactuals. Instead, those whose parents received the transfer show an 8 percent lower likelihood than the control group on having completed high school. These effects were statistically significant at the 10 and 5 percent level respectively.

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<sup>61</sup> Refer to the Methodology Chapter for more information about the flexibility given to the transfer recipient.

Adolescents that received the transfer directly also have higher aspirations of attending college than when compared to those whose parents received the transfer. The effect is only 1 percent higher in Model 1 to that obtained in the total sample. As with the above outcomes, estimates from the Transfer to Parents subsample were not statistically significant across all models. Adolescents that received the transfer directly are 8 percent more likely to aspire to attend college than when compared to the control group. This effect is significant at the 1 percent level. As with the previous result, adolescents whose parents received the transfer have a negative coefficient of 9 percent on the aspiration to attend college. This effect is significant at the 5 percent level. If adolescents from poor backgrounds need to cover personal expenses while helping out in the household, receiving the transfer directly might reduce the need to work, or at least the number of hours that an adolescent might need to dedicate to work.

Consistent with previous findings, both subgroups are more likely to be combining work and study than the control group. Nevertheless, adolescents whose parents received the transfer have a 19 percent higher likelihood; those who received the transfer directly have a 12 percent higher likelihood. Both coefficients are significant at the 1 percent level. Although all coefficients are negative, no differences were observed in the likelihood of being only studying or only working between both subgroups. Interestingly, reductions of idleness were stronger among those whose parents received the transfer (10 percent) than for those that received the transfer directly (7 percent) and no significant effects were seen among both subgroups and the control group on the likelihood of having a formal job.

### **Is transferring cash directly to adolescents more effective in reducing risky behaviors?**

As seen previously, the YAP is flexible about transferring the money directly to the parents or to the adolescent. No matter who receives the Conditional Cash Transfer, adolescents are compelled to attend school and the YAP After School Program in order to

receive the transfer. How does transferring cash directly to adolescents affect educational and labor outcomes? One could think that transferring cash directly to the adolescents could increase the consumption of risky behaviors such as cigarettes, alcohol and drugs. Instead, if transferring the money to the adolescents has a direct and higher income effect on the adolescent that created a higher substitution effect, allocating more time into schooling and less time into hours worked or idleness, we could also expect reductions on the consumption of risky behaviors.

Although both groups had significant improvements on the use of contraceptives, adolescents whose parents received the transfer have higher effects than those that received the transfer directly. This effect is 21 percent for the transfer to the adolescent subgroup and 24 percent for the transfer to the parents' subgroup. Both coefficients are significant at the 10 percent level. Interestingly, the transfer to the adolescent subgroups has a 3 percent higher likelihood of having a teen pregnancy than when compared to the control group. This effect is significant at the 10 percent level and no significant effect was obtained for the cash to parent subgroup. Very importantly, only those that received the transfer directly showed a significant reduction of 3 percent on the likelihood of having an unplanned pregnancy. Although this has divergent economic implications, particularly for the female's future education, work and labor, it shows that in many cases, teen pregnancy is not necessarily an accidental result of risky sexual behaviors, but instead a deliberate decision. Only those adolescents that received the transfer directly had a significant reduction in the frequency of using cigarettes at the age of 17 than when compared to the control group. This coefficient was significant at the 5 percent level and no significant effects were observed among those whose parents received the transfer and the control group. Regarding alcohol use, both groups showed a significantly higher frequency of use than the control group. Nevertheless, the effect was higher for the transfer to parents' subgroup (25 percent) than for the transfer to

the adolescents' subgroup (18 percent). These results were significant at the 10 percent and 5 percent level respectively.

Higher reductions on risky behaviors for those adolescents that received the transfer directly are consistent with drug use. Only those adolescents that received the cash directly had a small but significant reduction of 2 percent on the likelihood of using drugs. This coefficient is significant at the 10 percent level. As discussed in the previous section, risky behaviors among adolescents often reach their peak by the age of 14 to 16. In this sense, regardless of who received the transfer, the program is not stopping adolescents from trying out drugs. It would have been interesting to separate the analysis by ages, given the different utility functions of adolescents according to age and gender. Nevertheless, given the size of the sample, the results would lose too much statistical power if the transfer recipient subgroup was in addition divided by ages and among females and males.

#### **Discussion: Exploring Why Transferring Cash Directly to Adolescents is More Effective**

Results show that giving money directly to adolescents seems to be more effective on keeping them studying, therefore decreasing the time dedicated towards work. This transfer also further reduced idleness and unplanned pregnancies. The evidence from this study suggests that when the transfer is given directly to the adolescent the program results in both substitution and income effects that tend to reinforce each other. The change in prices on the adolescents' budget allows for them to allocate more time to school as well as to the After School program, and less time to work. When the transfer is given to parents, the income effect benefits primarily the household, creating a lower substitution effect. In this case, adolescents still need to work to pay for their own expenditures.

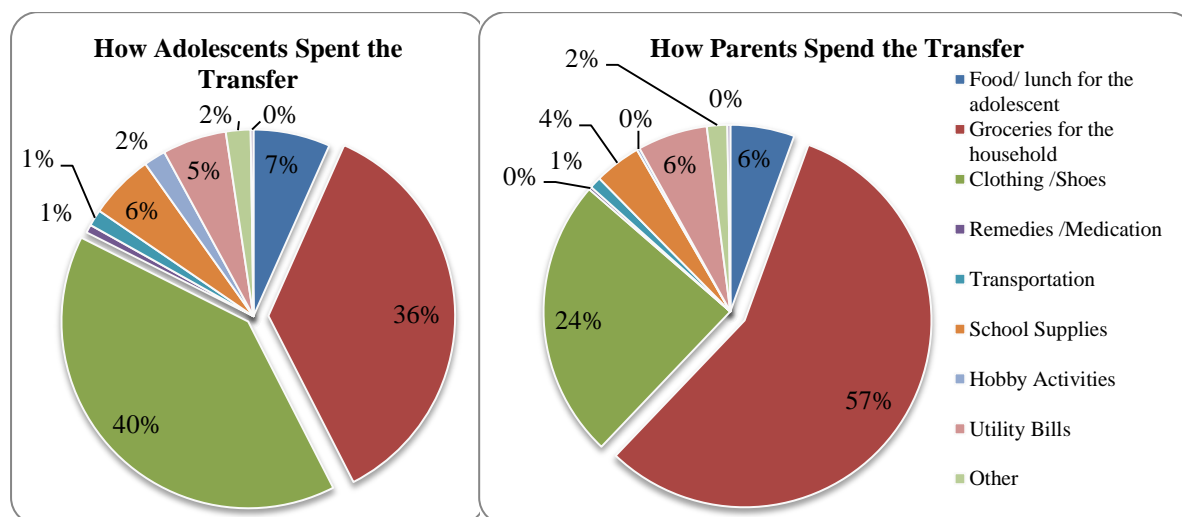
As seen in the theoretical framework chapter, this dissertation considers that adolescents (and not their parents) are making the decisions on how they allocate their time between schooling, work and leisure. Adolescents maximize their utility subject to the



consumption of their own goods, but also goods for the household. Graph 4 below shows for example, that parents who received the transfer (and therefore made the decision on the allocation of resources) allocated 63 percent of the cash to household expenditures (e.g., groceries and utility bills) and 37 percent to adolescent-related expenditures. Instead, when the transfer was given to the adolescent, 54 percent was put into personal expenditures (e.g., clothing, school supplies, food or lunches and leisure activities) and 46 percent to household-related expenditures (e.g., groceries).

Figure 7

*How the Cash Transfer is spent*



Source: Author's own elaboration using the Projeto Agente Jovem Dataset.

In this sense, when the cash transfer is given to the beneficiary and not to the parents, the income effect benefits primarily the adolescent because it covers more of the personal expenses of the adolescent. Since adolescents make decisions about their own time allocation, this income effect further reduces the number of hours they would need to allocate to work, and increases the hours allocated toward school and the After School Program. This pseudo-substitution effect, leads to less absenteeism, decreased dropouts and grade retention that is reflected in higher school completion rates and educational aspirations. However, an increase in school completion does not necessarily mean that the transfer sent directly to the student is completely substituting labor. Evidence from the likelihood of combining work and

study implies, instead, that they might have to dedicate a lower amount of hours to work than those whose parents received the cash directly. Furthermore, due to the 8-hour duration of the program (School and After School program), this result suggests that most of the increased time at school took place at the expense of leisure.

This study shows that it matters where money goes; particularly because the household does not seem to have a unitary function. Microeconomic theory has historically worked with a unitary framework, in which individual preferences get aggregated into a household utility function. Issues such as intra-household inequality and household formation/dissolution, composed households cannot be handled very well under these models (Rode, 2011). Evidence from this chapter shows empirical evidence of decision making complexity for non-unitary households. If the transfer is given to the parents instead, the income effect benefits mainly the household and does not cover necessarily most or all of the personal expenses of the adolescent. For this reason, adolescents needed to work while attending the program in order to pay for their personal expenses. The opportunity cost of this program is higher for this subgroup that must then attend school, the after school program and work more hours in order to pay for their personal expenses while helping at home. The cost of schooling then is held by the adolescent and the benefits are for the family. This would explain why adolescents whose parents received the transfer have lower schooling outcomes, lower reductions on idleness and increased likelihood of combining schooling and labor.

Although few CCT programs give cash transfers directly to adolescents, there are currently some programs that have introduced direct incentives that benefit not only parents, but also students. For example, *Oportunidades* in Mexico has a special component called *Jóvenes con Oportunidades* (Youth with Opportunities) that opens an account in the last year of secondary school and deposits points equal to Mexican pesos for the subsequent year

through the completion of the 12<sup>th</sup> grade. After graduation from high school, students can use that money to attend college or to start a business. Although this incentive did not reduce the immediate opportunity cost of going to school and not working, it reduced school dropouts by 23 percent among youth aged 16 to 19 (The World Bank, 2007). Another example is Opportunity NYC (Family Rewards), a CCT in New York City that gives monetary incentives to adolescents in high school to improve school attendance and school performance on interim assessments. Riccio et al. (2010) showed that high school students (that received part of the cash transfer) had larger gains in school attendance and performance than middle school students (whose parents received the incentives).

With regards to sexual behavior outcomes, while both groups had significant increases in the use of contraceptives (21 to 24 percent), only those adolescents that received the transfer directly showed a significant reduction of 3 percent in the likelihood of having an unplanned pregnancy. The rationale is, by receiving the transfer directly, young men and women are able to buy contraceptives more frequently. Due to their low or no income, adolescents are very sensitive to a change in prices. The cost of contraceptives for adolescents that do not have high incomes or are dependent on their parents can be very high, creating an important income effect on adolescents' personal expenses. Reducing the income effect of the cost of contraceptives is crucial since, although Brazil's universal health care provides free contraceptives, adolescents under 18 must come with their parents to get them in public hospitals. Studies suggest that many adolescents are not using the services due to fear of their parents knowing about their sexual behavior (Carvacho et al., 2008). In addition, with the health-related component of the After School Program, girls would have more information available about the use of contraceptive methods, and free government reproductive health services.

Interestingly, this study found that although adolescents that received the transfer had strong gains in the use of contraceptives, and a significant reduction of 3 percent in unplanned pregnancies, there was a significant increase of 3 percent in the likelihood of having a teen pregnancy (planned or not). How can there be an explanation for this contradictory result? First, this reduction in the likelihood of having an unplanned pregnancy is consistent with previous findings from this study, since adolescents that received the transfer directly have greater gains in schooling and educational aspirations and in the use of contraceptives. Women enrolled in school may be less likely to have a teen pregnancy (unintended) because childbearing might be less common among their peers (Barber, 2000). Furthermore, the opportunity cost of getting or being pregnant may be higher for women that have remained in school, since the perspective of future earnings is higher (Kraft & Coverdill, 1994; Rich & Kim, 2002). This is the case of the effects of Zomba, a randomized experiment in Malawi on sexual behaviors. This Conditional Cash Transfer among never married, 13-22 year-old schoolgirls, transferred \$10 US dollars a month, conditional on satisfactory school attendance. The transfer was split between the student's guardian (70 percent) and the girl herself (30 percent). This program showed significant declines in early marriage, teenage pregnancy and self-reported sexual activity among program beneficiaries after just one year of program implementation (Baird et al., 2009). To my knowledge, no other CCT programs have studied the effects of giving transfers directly to adolescents based on sexual behaviors.

Nevertheless, how can we explain that with better schooling outcomes, higher college aspirations and a higher use of contraceptives that there still remains an increased likelihood that adolescents that received the transfer directly might desire and plan to get pregnant (or to impregnate). Perhaps, due to the possible higher exposure to the program, adolescents that received the transfer: 1) Already had a child before joining the program, explaining why they

received the money directly, and decided to have a second child, 2) Those that wanted to have a child felt more confident doing so due to the higher knowledge about government offered programs for prenatal care, delivery and child care.<sup>62</sup> There seems to be a strong effect of unobservable psychological characteristics as a result of social norms rooted for generations in the family and in the community that a two-year program cannot change so readily. Indeed, as discussed in the previous section, this can be explained by the status brought on by motherhood and a result of the normalization of teen pregnancy since their mothers, siblings, neighbors and classmates all engaged in this activity. Girls dating older partners might be more likely to get pregnant in order to be allowed by the parents to move in with the boyfriends (Carvacho et al., 2008).

The results obtained from the transfer recipient analysis also show that adolescents that received the transfer directly have lower consumption of cigarettes and drugs than when compared to the control group and with those whose parents received the transfer directly.<sup>63</sup> An interesting fact is that while both groups had a higher frequency of drinking than the control group, the incidence was lower among those that received the transfer directly (17 percent), than for those whose parents received the cash (25 percent). These results are very interesting since they are counterintuitive. Evidence suggests that because adolescents do not have high incomes or are dependent on their parents, changes in prices strongly affect their decision making on drugs, cigarettes and alcohol consumption. Evidence from a longitudinal study about adolescent consumption of risky products suggested that, as the real price of marijuana, cocaine, cigarettes and alcohol falls, consumption strongly increases (Grossman, 2004). If transferring the cash directly to the adolescent has a stronger direct income effect on

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<sup>62</sup> These programs are all included in the *Registro Unico of Bolsa Familia*.

<sup>63</sup> The effects of the use of contraceptives, sexual behavior and the consumption of cigarettes, alcohol or drugs are also related to the age of the person. Due to problems with the sample size, I cannot perform a subgroup analysis by age on the different transfer recipient groups.

the price of these goods, how to explain then, that giving the cash transfer to the adolescents means further reducing the consumption of most of these goods?

Furthermore, studies consider cigarettes and cannabis as a gateway to the consumption of alcohol or stronger drugs such as cocaine, acids or heroin. In the case of the effect of the YAP, the reductions in the frequency use of cigarettes, and the increase of alcohol consumption, might be a result of age and gateway effect. By the time the survey was implemented, adolescents might have already transitioned from cigarettes to alcohol. The question is, why the treatment group shows higher consumption than the control group.

### **Summary**

Transferring the money directly to adolescents is more efficient for improving schooling outcomes by creating a direct income effect on the adolescents. This direct income effect can also help adolescents to pay for contraceptives and in some cases alcohol. Results indicate that, contrary to fears of increasing the consumption of risky behaviors, it seems that overall, transferring the cash directly to the adolescent is helping them to dedicate more hours to school and less to work, improving thus schooling outcomes and decreasing the likelihood of idleness while reducing risky behaviors. The more positive effects when the transfer is given to the adolescents can be explained by a stronger income and a pseudo-substitution effect, but also by endogenous characteristics of those adolescents that received the transfer. Despite this latter possibility (that will be discussed in the last section of this chapter) there is recent evidence of the fact that giving incentives directly to adolescents is more effective in improving school outcomes and reducing risky and sexual behaviors.

Table 9

*Schooling and Labor Outcomes – Effects by Cash Transfer Recipient*

Outcome	Transfer to Adolescents	Transfer to Parents
Completed Middle School	0.215*** (0.037)	0.005 (0.048)
Completed High School	0.049* (0.042)	-0.083** (0.052)
Has College Aspirations	0.084*** (0.036)	-0.084** (0.052)
Only Studying	-0.036 (0.035)	-0.042 (0.045)
Study and Work	0.120*** (0.035)	0.156*** (0.048)
Only Working	-0.010 (0.045)	-0.014 (0.042)
Idle (Not Working and Not Studying)	-0.074*** (0.028)	-0.099*** (0.033)
Formal Job (Carteira Assinada)	-0.006 (0.051)	0.063 (0.068)

Note.\*Significant at 10%; \*\*significant at 5%; \*\*\* significant at 1%. All outcomes are estimated using the same set of covariates. All results use bootstrapped standard errors. Young ages 16 and 17 were excluded from the high school sample. Transfer to adolescents N= 1757, working sample N=1085. Transfer to parents sample Parents N= 898, working sample N=587.

Table 10

*Risky Behavior Outcomes - Effects by Cash Transfer Recipient*

Outcome	Transfer to Adolescents	Transfer to Parents
Use of contraceptive methods	0.214** (0.096)	0.243** (0.123)
Teen Pregnancy	0.031* (0.029)	-0.002 (0.032)
Unplanned Pregnancy	-0.031* (0.029)	-0.027 (0.032)
Frequency smoking cigarettes	-0.168** (0.081)	-0.070 (0.097)
Frequency drinking Alcohol	0.177* (0.120)	0.248** (0.160)
Currently of Drugs	-0.016* (0.015)	-0.005 (0.016)

Note.\*Significant at 10%; \*\*significant at 5%, \*\*\* significant at 1%; All outcomes were estimated using the same set of covariates. All results use bootstrapped standard errors. Transfer to adolescents sample N= 1757. Use of contraceptive sample N=1189. This sample only includes adolescents that reported already have their first sexual relations. Models 1-3 for the transfer to Parents sample N= 898. Models 1 -3 from using contraceptive methods only include adolescents that reported already had their first sexual relation N= 602.



**CHAPTER 8.**  
**THE AMOUNT OF TIME ALLOCATED TO THE**  
**AFTER SCHOOL PROGRAM MATTERS**

The extent to which the program has a significant impact on human capital and work of adolescents could also be determined by the amount of time allocated to both schooling and an after school program: high dosage, middle dosage and low dosage program participation. In theory, beneficiaries should attend at least 16 hours per week to attain the minimum requirement of 80 percent attendance to receive the transfer but all participants did not necessarily meet this conditionality. High dosage, includes adolescents that attended the after school program more than 16 hours per week or more than 80 percent of the time of the minimum attendance conditionality (N= 666). Middle Dosage, includes students that attended the program for 10 to 15 hours per week (or 50 to 80 percent of the time (N= 632). Finally, Low Dosage represents the subgroup that attended the After School Program less than 9 hours per week (or less than 50 percent of the time, (N = 395) (See Table 2 in Chapter 5 and Appendix D).

Tables 18 to 19 report the causal estimates obtained from Propensity Score Matching Methods using the Average Treatment Effect on the Treated (ATT) Nearest Neighbor Matching with Replacement, obtained from the program dosage analysis. All standard errors for the matching results were bootstrapped 1,000 times. All models met the balancing criterion that the treatment and control groups did not differ in terms of covariates to calculate the propensity scores (See Appendix F for balance and histograms). This chapter starts by studying the effect of the YAP by dosage group on schooling, labor and risky behavior outcomes, followed by a discussion of the results. Establishing a causal inference with a dosage analysis is particularly challenging, since unobservable variables non-cognitive

skills (e.g. reliance, discipline, punctuality) might be correlated with being part of the high dosage group and, therefore, to the program effects.

**Is the amount of time allocated to the program a predictor of better schooling and labor outcomes?**

Adolescents that attended the program more than 16 hours per week (High Dosage) are 12 percent more likely than their counterfactuals to have completed middle school. The Medium Dosage group that attended the program from 10 to 16 hours per week, have instead an 11 percent middle school completion. Interestingly, those adolescents that attended the program less than 10 hours a week (Low Dosage group), benefited more from the program in middle school completion. The effect was 15 percent, 3 and 4 percent higher than the other subgroups. All results were significant at the 1 percent level.

As expected, adolescents in High Dosage subgroups have consistently better outcomes than those in the Medium and Low Dosage groups into high school completion. Former program beneficiaries showed an 11 percent higher likelihood of completing high school than their counterfactuals and the effect is significant at the 5 percent level. There were no significant effects the Medium and Low Dosage group. Similarly, only adolescents in the High Dosage subgroup obtained significant aspirations to attend college. Former program participants in this group were 7 percent more likely than their counterfactuals to aspire to attend college. No significant effects were found for the middle and low dosage groups and the control group. These results suggest that occupying more time in adolescents' afternoons matter. Furthermore, structuring the afternoon time with academic, sportive, artistic and cultural activities is bringing additional gains to adolescents.

As in schooling outcomes, the time former YAP participants had available to work during the program was determined by the amount of time they allocated to the after school program. We could assume that the time allocated to the program and to work during the

program is correlated with the likelihood of studying after finishing the program. Interestingly, high program dosage students show a 5 percent reduction in the likelihood of only studying. This coefficient is nevertheless only significant at the 10 percent level. Negative coefficients but no significant effects are observed among Middle and Low Dosage students and the control group.

Consistent with previous findings, all dosage groups are significantly more likely than the control group to be working and studying at the same time. Interestingly, high dosage former program participants, that had better schooling outcomes, also present higher coefficients on the likelihood of being studying and working (10,1 percent) than when compared to the Medium (9,4 percent) and Low Dosage groups (8,5 percent). All of the coefficients were significant at the 1 and 5 percent level.

High Dosage students were also the only group to show reductions on the likelihood of being only working (2 percent). This effect is significant at the 5 percent level. As in the only studying outcome, negative coefficients but no significant effects were observed among Middle and Low Dosage students and the control group. Interestingly, the highest reductions on idleness were among the Middle Dosage (7 percent) and Low Dosage groups (6 percent) compared to 3,5 percent of the High Dosage group. This could indicate that if low attendance to the program was caused in part by idleness, the YAP partial assistance might have improved the motivation or the will to be more active, look for a job and keep studying.

Better schooling outcomes and greater high school completion for the High Dosage group, does not mean that students will have a better work situation after the program. In addition, no significant effects were found as well for the Medium Dosage and Low Dosage groups. The fact that the standard errors did not vary significantly across the three models suggests that the difference between the coefficients and their significance is not explained by smaller samples. Consistent with previous results, adolescents and the young across all

groups have a higher likelihood of combining work and study than their counterfactuals. The fact that the YAP Low Dosage group had higher reductions in idleness can also be evidence that this group was missing so many after school program days not only due to labor, but that some was due to idleness.

**Is the amount of time allocated to the program a predictor of decreased risky behaviors?**

As seen in Table 13, the best outcomes of adolescent sexual behavior were for former participants that attended less than 10 hours of the program. The Low Dosage group was 39 percent more likely than the control group on the likelihood of using contraceptives always or almost always. The Medium dosage group had a significant improvement of 18 percent and the High Dosage group did not show significant differences with the control group. No significant effects were obtained across Dosage groups but consistent with the effects of the use of contraceptives, only the Low Dosage group had a negative coefficient. Furthermore, only the Low Dosage group had a 6 percent reduction of the likelihood of having an unplanned pregnancy. While this effect was significant at the 5 percent level, the High Dosage and Medium Dosage subgroups had a negative but not significant effect.

Unlike previous outcomes, higher reductions of the frequency of smoking cigarettes were observed among the High Dosage and Medium Dosage groups. This reduction is 20 percent for those that attended the program 16 or more hours per week, 12 percent for those that attended the program from 11 to 15 hours a week. While these effects were significant at the 1 and 5 percent level respectively, the Low Dosage group did not have significant reductions on the frequency of smoking cigarettes. Consistent with the results in previous chapters, this study only obtained positive effects on the frequency of drinking alcohol. The High Dosage group has for example a 17 percent higher frequency of drinking alcohol than their counterfactuals. This effect is even higher for the Low Dosage subgroup, with a positive

effect of 43 percent. Both coefficients were significant at the 10 and 1 percent level respectively. Furthermore, only former program participants from the Medium Dosage group had a small but significant reduction of 2 percent on the likelihood of using drugs after the program. This effect is significant at the 10 percent level.

### **Discussion: Exploring the Effects of the After School Program Dosage**

It is crucial to be careful with the interpretation of the results obtained from the dosage analysis. First, establishing a causal inference with a dosage analysis is particularly challenging, since unobservable non-cognitive skills such as reliance, discipline, punctuality might be correlated with the program attendance and, therefore, with the program effects. Secondly, this is also an issue when working with a method such as Propensity Score Matching in which the assumption of controlling for unobservable remains theoretical and difficult to demonstrate.

The number of hours that participants attended the after school program matters. The after school program attendance conditionality creates an additional time constraint to schooling in which program participants must allocate 4 to 5 hours per day to structured leisure activities in the after school program. The characteristics and the content of these activities, the different socialization patterns among peers of the program and the reduced community effect, might also be an explanation for the outcomes effect. It is hard to make causal inferences about the effect of specific activities on the program of the schooling, labor and risky behavior outcomes, but the amount of time spent at the program can give us some idea. Table 11 shows<sup>64</sup> for example, only 39.34 percent of students attended the program more than 80 percent or at least 16 hours per week of the program attendance required number of hours (High Dosage). A total of 37.33 percent attended from 10 to 15 hours per week (Medium Dosage) and 23.33 percent attended less than 10 hours per week (Low

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<sup>64</sup> The survey does not contain information about the school attendance dosage only about the After School Program attendance.

Dosage). If, on a normal day, an adolescent from the low dosage group attended schooling for 4 hours in the morning, and 1.5 hours in the program (or two days or 4 hours), he/she still has enough time, in the afternoon or at night, to work.

Table 11

*Dosage groups program participation*

Group	Number of Students	Percentage of Students	Average Weekly hours	Average Daily hours
Low Dosage (2 to 9 hours)	395	23,33	7,54	1,5
Medium Dosage (10 to 15 hours)	632	37,33	13,5	2,7
High Dosage (16 or more)	666	39,34	20,1	4,02

Source: Author's own elaboration using the Projeto Agente Jovem Dataset.

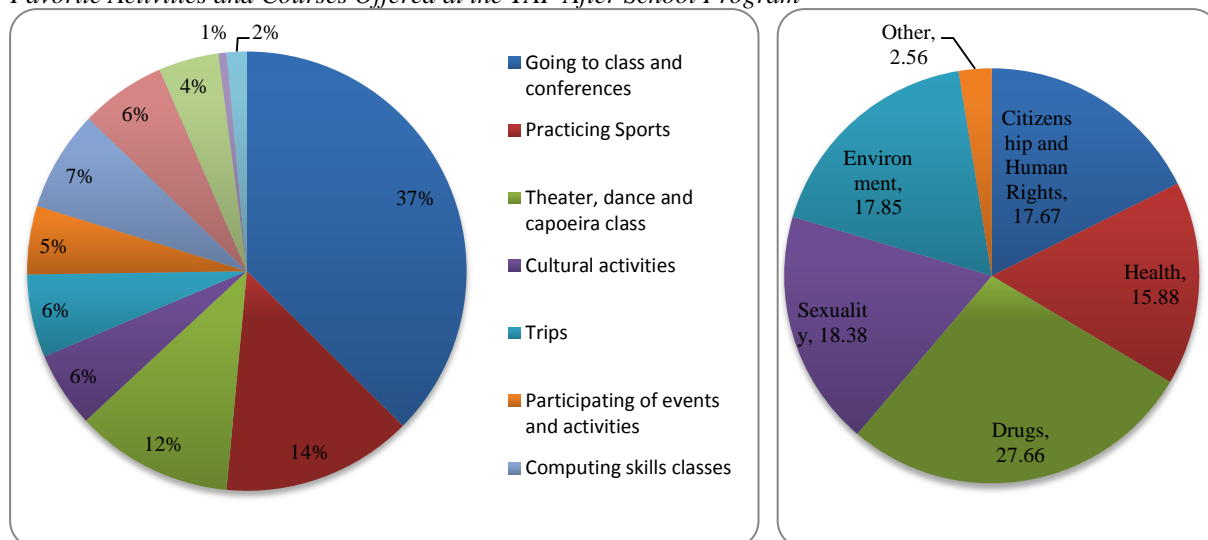
As seen in the Program Dosage Analysis, the number of hours that a participant attended the after school program matters. Overall, students that attended the program more than 16 hours per week have higher middle and high school completion rates as well as college aspirations. Interestingly, the highest reductions on idleness were among the Middle Dosage and Low Dosage groups compared to the High Dosage group. Very important, High Dosage former program participants that had better schooling outcomes, also presented higher coefficients on the likelihood of studying and working than the other subgroups. If Low Dosage students were working more hours during the program, this could explain why they present no significant effects in high school completion with regards to the control group.

The dosage effect could be explained by the fact that the YAP After School Program offers activities that include conferences, sports, arts, theater, cultural trips, health talks, computing skills classes, job training and internship services. Graph 5 shows in detail all the preference program activities. A total of 37 percent of adolescents enjoyed going to classes and conferences the most, 14 percent practicing sports and 12 percent theater, dance or *Capoeira* classes. Classes and conferences offered at the program included topics of citizenship and human rights, health, drugs, sexuality and environment. Most courses and

conferences about citizenship and human rights are designed to debate current social issues of poverty, inequalities and discrimination in Brazil. Around 28 percent of adolescents preferred the courses about preventive drug use, 18 percent of adolescents reported having enjoyed the most courses about citizenship and human rights, and sexuality and environment and 16 percent enjoyed the health talks. Although the YAP dataset does not contain information about resources or teacher training, 80 to 90 percent of former program beneficiaries gave excellent or good grades to all program activities. The lowest grades were given to computing skills, training for jobs and internship services (See Graph 6).

Figure 8

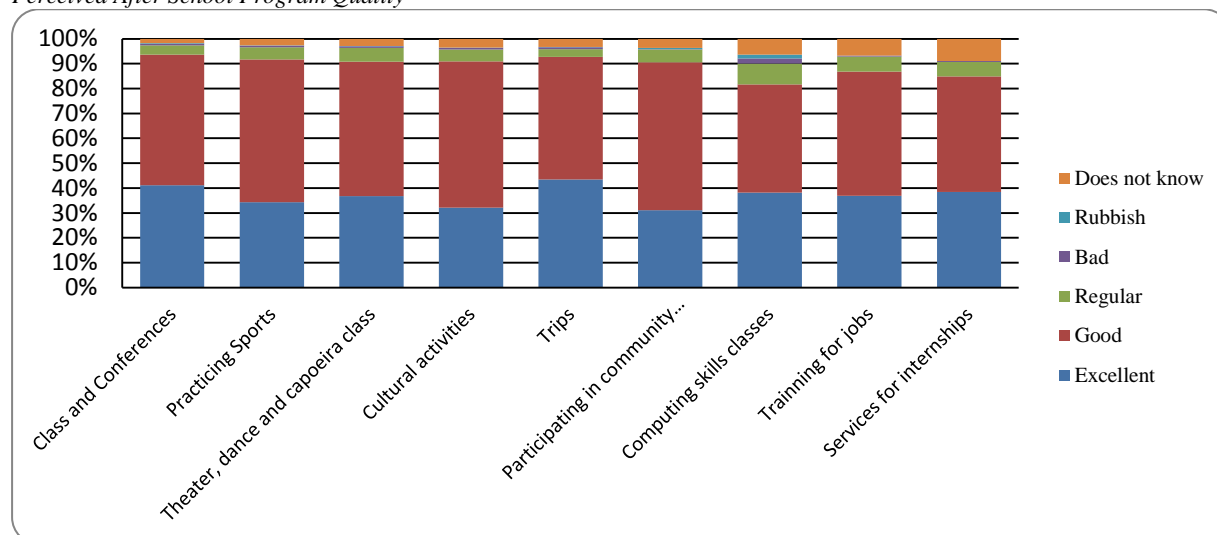
*Favorite Activities and Courses Offered at the YAP After School Program*



Source: Author's own elaboration using the Projeto Agente Jovem Dataset.

Figure 9

Perceived After School Program Quality



Source: Author's own elaboration using the Projeto Agente Jovem Dataset.

Despite the lack of an academic component, the after school program activities could have positive effects on education attainment and labor outcomes by improving non-cognitive outcomes. The time allocated within the program to structured leisure activities such as sports (particularly competitive games) arts, theater or *Capoeira*<sup>65</sup>, develops the ability of adolescents to perform in public (in front of adults), makes them more competitive, mentally tough and confident. In the case of team sports, team activities such as theater or *Capoeira*, can develop leadership skills and the ability to work in teams. Furthermore, in the case of Brazil, where *Favelas* are well known to be dangerous, in many cases controlled by drug traffickers, the natural growth within the community can have even worse effects. Due to the lack of non-cognitive skills outcome information in the survey, it is hard to make causal inferences of the effects of those skills on schooling and labor outcomes. Nevertheless, the dosage analysis could bring a strong association between the characteristics of the After School Program and the outcomes. Indeed, studies suggest that practicing sports, theater, dance or *Capoeira*, enhances non-cognitive skills such as self-discipline, perseverance and independence. Such traits are important predictors of student grades and can also determine

<sup>65</sup> Capoeira is a Brazilian martial art created by former African descent slaves that combines elements of dance, and music.



whether students are going to be able to successfully combine work and study, at a secondary school or at the college level (Heckman & Krueger, 2004). Furthermore, studies suggest that non-cognitive student attributes are important features required for personal development and job productivity, highly valued by employers and with important social returns such as democratic participation (Levin, 2011).

Drawing on in-depth observations, Lareau (2003) shows for example that in addition to education quality, differences in the achievement of the black and white middle-class, working-class and poor families in the US are explained by the role of structured leisure time. She argues that the organizational style of sportive activities replicates key aspects of the workplace. Sports are thus training children to understand the rules of the game that govern interactions with institutional representatives, both at school and with future employers. Lareau (2003) explains how “concerted cultivation” is designed by middle and upper income parents to draw out children's talents and skills, while working-class and poor families rely on natural growth in which a child's development unfolds spontaneously among peers in their community. In that sense, the structured leisure activities organized by the YAP's After School Program can also have a positive effect on middle school and high school completion among women, a reduction in idleness and reduce certain risky behaviors.

Asymmetries of information among program participants and the control group could also explain some of the outcomes. The YAP's After School Program offers, for example, information and facilitates the application of programs such as the PROUNI, a federally funded program that provides scholarships in private universities for low-income students. This could explain for example, why students (females, blacks and in the Southeast region) that are more involved in the program activities have higher educational aspirations than those that are not as involved.

The results obtained from the risky behavior section are not consistent with findings from the previous literature about the more positive effects of high dosage attendance on the reduction of risky behaviors (Prenovost, 2001; Welsh et al., 2002; St. Pierre et al., 1995). Instead, the Low Dosage group had 40 percent higher gains in the use of contraceptives and a 6 percent reduction in the likelihood of unplanned pregnancy than the other groups. Not only are these results consistent with those found in the general sample, the gender analysis and the transfer recipient analysis, but they are significantly higher.

The question is then, why were these students attending the program only 10 hours or less per week? Perhaps, the reason why they did not attend the program as many hours as they should have is that they were busy working and could not afford to meet the program's minimum attendance conditionality. This is consistent, for example, with the 30 percent reduction in the likelihood of being idle, having middle school completion and a 6 percent higher likelihood of combining work and study. In this sense, the Low Dosage Group is not missing part of the After School Program due to a lack of interest or inactivity, but due to an excess of activity. Interestingly, the High Dosage's only significant reduction of risky behaviors was the use of cigarettes. Furthermore, consistent with previous findings, both the High Dosage and Low Dosage groups had a higher use of alcohol than the control group. With regards to drugs, only the Medium Dosage group had reductions in the frequency of drug use. It is important to take into consideration that the lack of significant reductions on some of the outcomes of the High Dosage group could indicate that this group had a lower frequency on the use of cigarettes, alcohol and drugs than the other group. Furthermore, due to the great variety of program activities, more information would be needed about the kind of activities participants participated in the most. The implications of being too involved in sports are different than those of having attended all the health talks and conferences about sexuality.

**Summary**

Students that attended the program more than 16 hours per week have higher middle and high school completion rates as well as college aspirations. The time allocated to the program does not really reduce the likelihood of being employed after the program, or of combining work and study. Very important, the Low Dosage group presented higher reductions on idleness. If low attendance to the program was caused in part by idleness, the YAP partial assistance might have improved the motivation or the will to be more active, look for a job and keep studying. The Low Dosage group had higher gains in the use of contraceptives and on the likelihood of an unplanned pregnancy than the other groups but presented a very high use of alcohol.

Table 12

*Schooling and Labor Outcomes - Dosage Analysis*

Outcome	High Dosage	Medium Dosage	Low Dosage
Completed Middle School	0.122*** (0.041)	0.115*** (0.044)	0.115*** (0.041)
Completed High School	0.106** (0.047)	0.061 (0.068)	0.007 (0.054)
Has College Aspirations	0.067** (0.041)	-0.013 (0.049)	-0.015 (0.053)
Only Studying	-0.051* (0.039)	-0.032 (0.042)	-0.017 (0.038)
Study and Work	0.101*** (0.041)	0.094** (0.043)	0.085** (0.038)
Only Working	-0.015** (0.040)	-0.008 (0.038)	-0.006 (0.035)
Not Working/Not Studying	-0.035* (0.029)	-0.070*** (0.032)	-0.063** (0.038)
Formal Job (Carteira Assinada)	-0.005 (0.061)	-0.022 (0.059)	-0.020 (0.063)

Note: \*\*Significant at 10%; \*significant at 5%; \*\*\* significant at 1%. All models estimated using the same set of covariates. All models estimated using the same set of covariates. All results use bootstrapped standard errors. Adolescents aged 16 and 17 were excluded from the outcome completed high school. High dosage N=1161 and Working N=716. Medium dosage N= 1122, working N=681. Low dosage sample N= 890, working N= 531.

Table 13.

*Dosage Analysis – Risky Behaviors*

Outcome	High Dosage	Medium Dosage	Low Dosage
Use of contraceptive methods	0.122 (0.104)	0.183* (0.105)	0.394*** (0.121)
Teen Pregnancy	0.016 (0.028)	0.032 (0.031)	-0.027 (0.036)
Unplanned Pregnancy	-0.030 (0.033)	-0.010 (0.032)	-0.061** (0.035)
Frequency smoking cigarettes	-0.203*** (0.089)	-0.124* (0.092)	-0.058 (0.107)
Frequency drinking Alcohol	0.171* (0.130)	0.066 (0.142)	0.425*** (0.164)
Currently of Drugs	-0.014 (0.015)	-0.019* (0.017)	-0.020 (0.019)

Note: \*Significant at 10%; \*\*significant at 5%; \*\*\* significant at 1%. All models estimated using the same set of covariates. All models estimated using the same set of covariates. All results use bootstrapped standard errors. Adolescents aged 16 and 17 were excluded from the outcome completed high school. High dosage N=1161 and Working N=716. Medium dosage N= 1122, working N=681. Low dosage sample N= 890, working N= 53.

## CHAPTER 9.

### EXPLORING POSSIBLE SELECTION BIAS: IS PROPENSITY SCORE MATCHING CORRECTING THE SELECTION BIAS INTO THE YAP?

In the absence of program randomization, it is likely that many of the factors that influence placement of adolescents in the Young Agent Program, might also affect the outcomes. Results show that giving money directly to adolescents while enforcing the school attendance conditionality seems to be more effective in keeping them studying, therefore decreasing the time dedicated towards work while decreasing the likelihood of engaging in risky behaviors. While these results can be explained by a direct income effect on the adolescent's budget, it could also be a result of endogenous characteristics of those adolescents that received the transfer. In the absence of randomization of who receives the transfer, it is likely that many of the factors that influence the decision might also affect the outcomes.

The question is then, how was it determined who will receive the transfer? As discussed in Chapter 7, the flexibility on the transfer recipient being the adolescent could be brought by factors related to the family structure of the household and the age of the program beneficiary. Because a significant amount of adolescents do not live with their mothers and/or fathers, the transfer is likely to be collected personally. Interestingly, when comparing both transfer recipient subgroups, it is possible to observe that 5.3 percent more of the cash to adolescent subgroup is living with the father and mother. Furthermore, the decision of who gets the transfer can suggest that parents of the young that received the cash directly might be less involved or interested in the education of their sons and daughters. A second possibility is simply that more motivated and independent adolescents self-select to get the transfer suggesting that better schooling outcomes are reflected in personal characteristics and not on a higher income and a pseudo-substitution effect of the transfer given directly to them.

Like in the case of linear regressions, the causal interpretation of Propensity Score Matching rests on the unverifiable assumption that no unobserved variables are correlated with the outcome and with the likelihood of getting selected into the Young Agent Project (e.g. Motivation, ability). This chapter, shows several robustness checks to see whether Propensity Score Matching is efficiently correcting the selection bias into the Young Agent Project. The first section shows a sensitivity analysis applying Propensity Score Matching to different set covariates. The second section compares the treatment effects obtained from a Probit and Inverse Probability of Treatment Weighting. The last section performs a selection bias subgroup analysis.

### **Sensitivity Analysis**

It is important to be cautious with the analysis and the implications of program evaluations when results are not necessarily consistent across models and subgroup analysis. The magnitude and significance of the outcomes depend on model specifications and methods used. Furthermore, as Gibson-David & Foster (2006) suggest, including too few covariates in a Propensity Score Matching model might increase the model bias and including too many covariates might create some limitations of the results in terms of external validity. Tables 14 and 15, report causal estimates obtained using Propensity Score Matching Methods, an Average Treatment Effect on the Treated (ATT). All standard errors for the matching results were bootstrapped 1000 times. The estimates presented in all tables are based on three different specifications: The first column of each table shows the results from the simple Model (1), while the second column, included in the main Model (2), is the one used for the analysis of all outcomes. Finally, Model 3 balances the young and adolescents across the five great regions.<sup>66</sup> Results consistently indicate that the effect of the program depends on the model specification. All models met the balancing criterion that the treatment

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<sup>66</sup> See Table 2 for the description of the covariates included on these models.

and control groups did not differ in terms of covariates to calculate the propensity scores (See Appendix F for balance and histograms). The magnitude and in some cases the significance of the effects differed by up to 9 percent when using the simple model, the main model or the regional model. Overall, all models conserved the same significance, but the magnitude of the effects can strongly vary according to the covariates included. For example, when looking at middle school completion, using the simple model, the coefficient was 17.7 percent, when using the main model, the coefficient was 13.7 percent and when balancing by region, the effect decreased to 8.6 percent. All three coefficients were significant at the 1 percent level. In the case of aspirations to attend college, this test obtained different significances across models. While the simple model showed an 8 percent significant likelihood on the aspiration to attend college, the main and regional models did not obtain a significant effect. This could be explained by the choice of the covariates since the simple model, for example, does not balance across gender. Based on the significant effects of college aspirations among females, we could assume that Model 1 is significant because the treatment group might have more females than males, and only females seem to have positive aspirations to attend college. Furthermore, the lower coefficients of the regional model could be explained by the enormous socio-economic differences among Brazilian regions. Indeed, as seen on the subsample regional analysis, the Southeast region obtained consistently better schooling outcomes than beneficiaries from the Northeast region.

### **Comparison of Treatment Effects**

Propensity Score Matching methods rely on the same structural assumption for causal inference as linear regressions (namely the selection on observables assumption). Critics suggest that Propensity Score Matching methods do not correct more selection bias than linear regressions do (Gelman, & Hill, 2009). In order to see how the effects might vary when



using other methods, this study compared the treatment effect of linear regression<sup>67</sup> using the same sample of treatment and control across all subgroups; on the same set of covariates used for the main model (see Tables 16 and 17 for the total and gender sample in this Chapter and Tables H1 to H9, of Appendix H for the remaining samples). Furthermore, this study also compared the results with a method called Inverse Probability of Treatment Weighting. This is basically a linear regression using the weights obtained from the *p*score calculation, with the sample and the same set of independent variables. Overall, I obtained robust results across all treatment methods in the sense that all showed positive and significant effects on middle school completion, on the likelihood of combining work and study, and on reductions of idleness. These results were also consistent across the comparison of treatment effects among gender, ethnic groups and region subsamples.

It is interesting to note that the linear (Probit and OLS) regression estimates are considerably larger in absolute value and in some cases significance than those using Propensity Score Matching. For example, Table 16 shows that while the effects for middle school completion were 13.7 percent when using PSM, and 14.4 when using IPTW, the Probit regression obtained instead a 33.6 percent higher likelihood than when compared to the control group. All three effects were significant at the 1 percent level. This higher effect of the linear regression is consistent with almost all schooling and labor outcomes, in some cases being even three times the effect obtained by the PSM and the IPTW. With regards to significance, linear regression models obtained a higher significance than the two matching methods. Furthermore, for the most part, the coefficients conserved the positive or negative signs across the three methods. Table 17 in this Chapter and Tables H5 to H8 in the Appendix H, show the comparison of treatment effects for risky behaviors. The same pattern is observed with the exception of the use of contraceptive methods and on the frequency of

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<sup>67</sup> For all outcomes except for the frequency of the use of contraceptives, alcohol, cigarettes and drugs I use a Probit model since these are dichotomous dependent variables. For wage outcomes I use an OLS regression.

drinking alcohol, in which very similar but not significant effects were obtained for the Probit Model. Due to the size of the sample and subsamples, this lack of significance could be explained in part by the size of the standard errors on linear regressions. Results obtained with Inverse Probability of Treatment Weighting regression are for the most very close in magnitude and significance to those from PSM methods.

### **Recruitment and Selection Bias**

The higher coefficients obtained by the linear regressions (OLS and Probit) with regards to the matching methods might suggest that there might be a negative selection into the Young Agent Project. This could be explained by the fact that the local organizers of the After School Programs must recruit youth at risk within the communities. Information about the program suggests that local authorities of the YAP often look to recruit adolescents at risk of dropping out of school, working and engaging in violent behaviors such as drug trafficking. Of course, because the YAP does not deny anyone participation as long as they fulfill the maximum income requirements, some families and youth might self-select into the program as well. To explore the effect of being recruited or to self-select into the program, this study divided the sample into those that reported being recruited by the program (N = 529) and those that reported having looked at the program due to their own initiative (N = 1139).<sup>68</sup>

Table 18 in this Chapter illustrates these results. This analysis only included the outcomes that consistently obtained significant results across all models and methods used. The first column shows the results obtained from sample of adolescents that reported having been recruited or sent to the program, and the second column reports the coefficients of those that reported having gone to the program by their own initiative. Results from the self-

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<sup>68</sup> I created these two groups from the question asked in the survey to former program participants: "How did you look for the Young Agent Program?" There were only two options: 1) Own initiative, 2) Was recruited. An additional question asked: "Who sent you/recruited you to the program?" This was an open answer that included: School administrators, teachers or staff from the Young Agent Project, people from the church, other CCT or social programs (e.g. Peti, Sentinel), community associations, etc.

selection and recruitment analysis show that for the most part, both groups had positive effects on schooling, labor and risky behavior outcomes, but that those of the self-selected group were consistently higher across all coefficients. For example, with regards to middle school completion, recruited adolescents showed a coefficient of 0.047 percent and self-selected adolescents a coefficient of 0.183.

Furthermore, while the first coefficient was significant at the 10 percent level, the second was only significant at the 1 percent level. Only the self-selected group obtained a significant increase on the likelihood of completing high school as well as reductions of idleness. Both groups show a high effect in the drinking frequency of 10 percent and 13 percent respectively, on the likelihood of combining work and study, a very similar frequency than when compared to the control group. With regards to sexual behavior, while the recruited group had a significant increase of 18 percent on the likelihood of using contraceptives, the self-recruited group enjoyed a 30 percent increase. Consistent with these results, the recruited group had a 4 percent higher likelihood of having a teen pregnancy, and only the self-recruited group had a 5 percent reduction on the likelihood of having an unplanned pregnancy.

### **Summary**

The magnitude and significance of the outcomes of the Propensity Score Matching results depend on model specifications and methods used. Linear (Probit and OLS) regression estimates are considerably larger in absolute value suggesting that there might be a negative self-selection into the program and that matching methods are doing a good job correcting for part of the bias. Finally, the selection bias subgroup analysis suggest that while overall both groups had positive effects on schooling, labor and risky behavior outcomes, those of the self-selected group were consistently higher across all coefficients.

Table 14

*Sensitivity Analysis - Schooling Outcomes – Total Sample and Gender Subgroup Analysis*

Outcome	Total Sample			Females			Males		
	(1) Simple	(2) Main	(3) Regions	(1) Simple	(2) Main	(3) Regions	(1) Simple	(2) Main	(3) Regions
Completed Middle School	0.177*** (0.043)	0.137*** (0.035)	0.086*** (0.034)	0.196*** (0.051)	0.136*** (0.045)	0.044* (0.043)	0.144*** (0.057)	0.135*** (0.055)	0.151*** (0.052)
Completed High School	0.118** (0.045)	0.025 (0.039)	0.060* (0.035)	0.113* (0.063)	0.026 (0.039)	0.043 (0.058)	-0.002 (0.047)	-0.041 (0.044)	0.034 (0.048)
Has College Aspirations	0.076* (0.042)	0.036 (0.036)	0.028 (0.034)	0.138*** (0.052)	0.081** (0.047)	0.024 (0.045)	0.028 (0.055)	-0.002 (0.050)	-0.025 (0.050)
Only Studying	-0.039 (0.037)	-0.050* (0.034)	-0.040 (0.032)	-0.057 (0.048)	0.019 (0.044)	-0.010 (0.044)	-0.012* (0.047)	-0.031 (0.050)	-0.033 (0.054)
Study and Work	0.151*** (0.045)	0.120*** (0.037)	0.119*** (0.032)	0.156*** (0.050)	0.094*** (0.046)	0.083** (0.046)	0.124** (0.056)	0.141*** (0.053)	0.114** (0.053)
Only Working	-0.067* (0.037)	-0.022 (0.031)	-0.016 (0.030)	-0.026 (0.045)	-0.021 (0.042)	0.035 (0.040)	-0.106** (0.049)	-0.070* (0.048)	-0.004 (0.045)
Idle (Not Working and Not Studying)	-0.045* (0.033)	-0.047** (0.026)	-0.064*** (0.025)	-0.073** (0.045)	-0.093*** (0.042)	-0.077** (0.039)	-0.006* (0.031)	-0.040* (0.032)	-0.079*** (0.034)
Formal Job (Carteira Assinada)	-0.023 (0.052)	0.003 (0.049)	-0.011 (0.047)	0.016 (0.073)	0.010 (0.069)	-0.031 (0.071)	-0.026 (0.063)	-0.076 (0.101)	-0.088* (0.070)

Note \*Significant at 10%; \*\*significant at 5%; \*\*\* Significant at the 1% level. All PSM standard errors were bootstrapped 1000 times. Each model is estimated using the same set of covariates. For the high school completion outcome young ages 16 or 17 were excluded from the sample since it would be normal that at that age they have not completed high school. Model 1 -3 from the total N= 2183 and High School sample N= 1267. Models 1 -3 from the female subgroup N=1126 and High School sample N=638. Models 1 -3 from the Male subgroup N= 1057 and High School sample N= 629 .

Table 15

*Comparisons of Treatment Effects / Schooling and Labor Outcomes – Total Sample and Gender Subgroup Analysis*

Outcome	Total Sample			Female			Male		
	PSM	Probit/OLS	IPTW	PSM	Probit/OLS	IPTW	PSM	Probit/OLS	IPTW
Completed Middle School	0.137*** (0.035)	0.336*** (0.069)	0.144*** (0.035)	0.136*** (0.045)	0.309*** (0.098)	0.131*** (0.043)	0.135*** (0.055)	0.345*** (0.098)	0.135*** (0.046)
Completed High School	0.025 (0.039)	0.144 (0.061)	0.031 (0.042)	0.056 (0.060)	0.178 (0.140)	0.047 (0.058)	-0.041 (0.044)	0.122 (0.167)	-0.070 (0.051)
Has College Aspirations	0.036 (0.036)	0.074 (0.069)	0.037 (0.035)	0.081** (0.047)	0.157* (0.097)	0.077* (0.046)	-0.002 (0.050)	-0.023 (0.099)	-0.020 (0.046)
Only Studying	-0.050* (0.034)	-0.082 (0.045)	-0.048* (0.053)	0.019 (0.044)	0.038 (0.101)	0.028 (0.043)	-0.031 (0.050)	-0.243 (0.115)	-0.093** (0.037)
Study and Work	0.120*** (0.037)	0.252*** (0.068)	0.100** (0.042)	0.094** (0.046)	0.161* (0.095)	0.075* (0.042)	0.141*** (0.053)	0.329*** (0.068)	0.167*** (0.043)
Only Working	-0.022 (0.031)	-0.029 (0.075)	-0.028 (0.051)	-0.021 (0.042)	-0.001 (0.109)	-0.018 (0.037)	-0.070* (0.048)	-0.053 (0.106)	-0.036 (0.044)
Idle (Not Working and Not Studying)	-0.047** (0.026)	-0.275*** (0.090)	-0.038* (0.023)	-0.093*** (0.042)	-0.252** (0.113)	-0.086** (0.041)	-0.040* (0.032)	-0.306** (0.090)	-0.038 (0.028)
Formal Job (Carteira Assinada)	0.003 (0.049)	-0.053 (0.085)	-0.004 (0.045)	0.010 (0.069)	-0.045 (0.085)	0.006 (0.062)	-0.076 (0.101)	-0.002 (0.156)	-0.073 (0.083)

Note \*Significant at 10%; \*\*significant at 5%; \*\*\* Significant at the 1% level. Each model is estimated using the same set of covariates. For the high school completion outcome young ages 16 or 17 were excluded from the sample since it would be normal that at that age they have not completed high school. Model 1 -3 from the total N= 2183 and High School sample N= 1267. Models 1 -3 from the female subgroup N=1126 and High School sample N=638. Models 1 -3 from the Male subgroup N= 1057 and High School sample N= 629 .All PSM standard errors were bootstrapped 1000 times.

Table 16

*Comparisons of Treatment Effects Risky Behaviors Analysis – Total Sample and Gender Subgroup Analysis*

Outcome	Total Sample			Females			Males		
	PSM	PROBIT	IPTW	PSM	PROBIT	IPTW	PSM	PROBIT	IPTW
Use of contraceptive methods	0.190** (0.089)	0.193 (0.122)	0.230*** (0.088)	0.235* (0.145)	0.199 (0.158)	0.295** (0.145)	0.188* (0.105)	0.170 (0.198)	0.152 (0.105)
Teen/Young Pregnancy	-0.033 (0.026)	0.060 (0.092)	-0.018 (0.024)	0.014 (0.044)	0.044 (0.114)	0.023 (0.038)	0.037 (0.027)	0.079 (0.157)	0.039*** (0.014)
Unplanned Pregnancy	-0.039* (0.027)	-0.061 (0.090)	-0.032 (0.026)	-0.060* (0.043)	-0.129* (0.110)	-0.053 (0.043)	0.079 (0.109)	0.093 (0.165)	0.038*** (0.011)
Frequency smoking cigarettes	-0.160** (0.078)	-0.216*** (0.068)	-0.168** (0.078)	-0.136* (0.110)	-0.191*** (0.042)	-0.136 (0.105)	-0.196** (0.112)	-0.114** (0.099)	-0.072 (0.109)
Frequency drinking Alcohol	0.229** (0.115)	0.087 (0.066)	0.216* (0.148)	0.171* (0.089)	0.174 (0.138)	0.063 (0.145)	-0.014 (0.169)	-0.023 (0.098)	0.011 (0.170)
Currently Use Drugs	-0.018* (0.014)	-0.359** (0.145)	-0.019 (0.014)	-0.007 (0.014)	-0.265 (0.282)	-0.007 (0.013)	-0.010* (0.025)	-0.393** (0.171)	-0.008 (0.020)
Used drugs after the age of 16	-0.012 (0.017)	-0.060 (0.106)	-0.014 (0.019)	-0.001 (0.021)	-0.003 (0.162)	-0.001 (0.018)	-0.027 (0.030)	-0.137 (0.141)	-0.026 (0.031)

Note \*Significant at 10%; \*\*significant at 5%; \*\*\* Significant at the 1% level. All models estimated using the same set of covariates and samples as model 1. All PSM standard errors were bootstrapped.

Table 17

*Selection Bias Recruitment Effect*

Outcome	Recruited/Sent	Own Initiative
Completed Middle School	0.147* (0.046)	0.183*** (0.038)
Completed High School	-0.040 (0.049)	0.083** (0.042)
Study and Work	0.097** (0.045)	0.133*** (0.036)
Idle (Not Working and Not Studying)	-0.045* (0.033)	-0.068*** (0.027)
Use of Contraceptives	0.180** (0.113)	0.304*** (0.094)
Teen Pregnancy	0.038* (0.029)	0.005 (0.027)
Unplanned Pregnancy	-0.015 (0.030)	-0.050** (0.029)
Frequency Smoking	-0.112 (0.099)	-0.141 (0.013)
Frequency Drinking Alcohol	0.224* (0.153)	0.207* (0.123)

Note: \*\*Significant at 10%; \*significant at 5%; \*\*\* significant at 1%. All outcomes are estimated using the same set of covariates. All models estimated using the same set of covariates. All results use bootstrapped standard errors. Own initiative sample N= 1634, high school sample N= 919, Use of contraceptive sample reported sexually active N= 1099. Recruited/sent to the program N= 1044, high school sample N= 596, Contraceptive sample reported sexually active N=703

## CHAPTER 10.

### CONCLUSIONS

This dissertation expands on the knowledge about the economic implications of time allocation among low-income adolescents. It also provides valuable information on the mechanisms in which successfully designed incentives can maximize education, labor and reduction risky behavior outcomes. As evidence, it used the Young Agent Project (YAP) and the 2006 *Projeto Agente Jovem*, a Conditional Cash Transfer (CCT) for adolescents ages 15 to 17 in Brazil. For the analysis of this matched non-experimental data, this study used econometric techniques such as Propensity Score Matching (Average Treatment Effect on the Treated, Nearest Neighbor Matching with Replacement) and performed robustness checks with a sensitivity analysis by comparing the treatment effects obtained from linear regression and Inverse Probability of Treatment Weighting.

This study assumes that adolescents from low-income families in developing countries like Brazil acquire adult responsibilities very early in life and make their own decisions about how to allocate their time between school, labor and leisure. Due to the short day of 4 hours in public schools, the flexibility to study in the morning, in the afternoon, or at night, and the fact that in Brazil, adolescents are legally able to work at the age of 14, it is relatively easy for adolescents to accommodate school and labor or to have extensive periods of unsupervised leisure time in which they might incur into risky behaviors. New assumptions introduced in the theoretical framework in Chapter 4, predicted that adolescents make their own decisions on time allocation between schooling, labor, a combination of study, work and inactivity, or idleness. Furthermore, it is assumed that adolescents maximize their utility based on the consumption of goods, schooling, leisure, but also on status, giving a higher weight to the utility of an activity in the present than to the long-run implications of pursuing risky activities (Gruber, 2001). The new time allocation structured by the YAP



reduces risky behaviors among adolescents because it changes what determines status at school or with the after school program new community. Education, hard work and to be someone in life from the Brazilian expression, *Ser alguém na vida*, might come to replace violent behaviors, drug use or teen pregnancy.

Brazil's Young Agent Project (YAP) provides an interesting scenario to study the economics of time allocation among adolescents when given a cash incentive and a time constraint conditionality. First, it shows how cash incentives can play an important role in changing adolescents' and parents' behaviors. Secondly, due to the double conditionality of the program, it shows how more hours of structured leisure time have positive effects on schooling outcomes and some risky behaviors. Third, it provides evidence on how social programs targeting adolescents can be more effective when incentives are given directly to adolescents and not to their parents. It matters where money goes; particularly because the household does not seem to have a unitary household function. Due to the changing or historical structure of the family in Latin American countries, and particularly among low socio-economic individuals, empirical studies evaluating the impact of social programs on children and youth should incorporate a comparison of treatment effects among unitary households and non-unitary households. Finally, it shows how gender dynamics and ethnic and regional cultural and socio economic differences can play an important role on the program's impact.

### **Policy Implications and Recommendations**

Due to the fact that this study was done with a matched non-experimental data, it is important to be cautious with the interpretation of the results and the magnitude of the effects found. The sensitivity analysis and the comparison of treatment affects across other methods, showed different but consistent positive effects of the Young Agent Project on schooling, labor and risky behavior outcomes, demonstrating that Propensity Score Matching is doing a

good job correcting at least some of the selection bias. It is possible then to draw some policy implications and recommendations from some of the most important results of this dissertation. Due to the socio-economic, cultural and legal characteristics of Brazil, the conclusions and policy implications of this study are probably only applicable in the case of Brazil and other low and middle-income countries in Latin America and the Caribbean. In addition, due to the high cost of some of the following propositions, it is likely that only countries with the economic growth (and the investments in social welfare) of Brazil could afford to follow through with them. This section then discusses each of the most relevant results and its policy implications, followed by its policy recommendations.

***Higher cash incentives to reduce the opportunity cost of attending the program***

Evidence from Chapter 6 shows that there is a positive impact of the YAP, with better school completion rates and higher educational aspirations in the case of females. Former beneficiaries are more likely to combine labor and school instead of specializing solely in work or in school. Working while studying can affect school performance, school attendance and may be one of the causes of the strong age grade delays among program beneficiaries. Reducing the burden of labor on Brazil's youth is crucial to diminishing school absenteeism, low school performance, dropouts and age-grade delays since these have important implications on their future educational attainment, job opportunities and earnings. Due to age, the amount of the YAP cash transfer might not be enough to replace adolescents' foregone income. For example, estimates show that average monthly wages for ages 5-17 were R\$262 in 2007 (approximately US\$130) (IBGE/PNAD, 2009). This is already more than the per capita income requirement to be eligible to receive *Bolsa Familia* and the Youth Agent Project. Then, in order to decrease (not increase) the opportunity cost of going to school, Cash Transfers should meet adolescents' labor market wages even though this comes

at very high cost at the State or Federal government level. It would probably be one of the only ways of making low income adolescents specialize only in schooling.

### ***Incentives need to be given directly to adolescents***

Evidence from Chapter 7 suggests that transferring the money directly to adolescents further improves schooling outcomes by creating a direct income effect on the adolescents' budget. This direct transfer allows them to dedicate more hours to school and less to work, improving schooling outcomes and decreasing the likelihood of idleness while reducing risky behaviors. The policy implication and recommendation is that programs dealing with adolescents should make the transfers or give incentives directly to adolescents and not to their parents. This is important since the opportunity cost of this program is higher for adolescents whose parents received the transfer directly. The change in price on the adolescents' budget allows for them to allocate more time to school as well as to the After School program, and less time to work. When the transfer is given directly to parents however, the income effect benefits primarily the household, creating a lower pseudo-substitution effect. In this case, adolescents still need to work to pay for their own expenditures affecting thus schooling outcomes or performance. That is why, giving the transfer or incentives directly to adolescent can be more efficient on reducing the amount of time they spent working.

### ***Age grade delays and fast track options***

Despite important improvements in school completion outcomes, adolescents that benefited from the YAP are strongly delayed with regards to the average age of middle and high school completion in Brazil. Although these delays can be explained as well by late school entry, dropouts and poor school performance previous to joining the YAP, public policy could work towards helping age grade delayed students to completing middle school or high school faster. This is important since combining too many different ages in grades

generates age heterogeneity, which causes problems in the classroom for non-repeaters, as teaching methods change in an attempt to accommodate children and young from different ages, knowledge, performance and personal maturity in the same grade. This issue (added to the opportunity cost of schooling) can result in permanent school dropouts. That is why Federal and State governments in Brazil need to work together to offer within their schools or within CCTs fast track primary, secondary and high school education where age-grade delay students can be empowered to finish school in less time. Such an initiative is already being developed by the City of Rio de Janeiro called Escola da Amanhã (School of Tomorrow)<sup>69</sup>.

***The length of the school day should be increased and education quality improved***

Evidence from chapter 8 shows that the amount of time allocated to the after school program reflects better schooling outcomes but not necessarily higher reductions in risky behaviors. Students that attended the program more than 16 hours per week have higher middle and high school completion rates as well as college aspirations. Low dosage students show high and positive results on the likelihood of completing middle school and higher reductions of idleness, more frequent use of contraceptives and a lower likelihood of an unplanned pregnancy. These results suggest that low-income adolescents need to spend more time at school or in structured leisure activities provided by after school programs. The length of the school day in public schools should be increased to meet a time allocation similar to the one in private schools (eight hours) or the Young Agent Project's after school program.

Furthermore, efforts need to be made in education quality, particularly in the poorer regions such as the Northeast and the Northern regions and in *Favelas* in large cities such as Sao Paulo, Rio de Janeiro, Salvador, Recife or Fortaleza. One of the biggest critiques of CCT programs, is that little has been done about school quality (Reimers et al., 2006). Reimers et al., (2006) argues, for example, that due to the lack of improvements on education quality,

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<sup>69</sup> To my knowledge, there are not impact evaluations or publications about this recent policy. For more details about the Escola da Amanhã, see: <http://www.rio.rj.gov.br/web/sme/exibeconteudo?article-id=2281501>

CCTs do not provide real future educational and job opportunities to children and therefore, do not necessarily alleviate the great long-term goal of CCTs: to reduce the intergenerational transmission of poverty. Several studies suggest that it is the quality of the education supply and not only enrollment that increases learning outcomes (Vermeersch & Kremer, 2004).

***Health talks should be included within CCT conditionality and at schools***

Evidence from this dissertation shows that schooling, labor and risky behaviors are almost mutually exclusive. This means that reductions of risky behaviors among program participants (and particularly among females) suggest that the health talks within the program that include subjects of sexuality, contraceptive methods, sexually transmitted diseases and the risks of using drugs or alcohol are very important to prevent or reduce risky behaviors among adolescents. Health talks should be part of the transfer conditionality for adolescents and children in CCTs across Latin America and the Caribbean. In a country like Brazil with universal health coverage, it is particularly important to overcome the psychosocial barrier that impedes many low-income adolescents to access health services due to fear or lack of information. In addition, although Brazil's universal health care provides free contraceptives, adolescents under 18 are required to come with their parents to public hospitals to receive any contraceptives or any medical attention. Studies suggest that many adolescents are not using the free hospital services due to fear of their parents finding out about their sexual behavior (Carvacho et al., 2008). Public hospitals should allow adolescents to access services and free contraceptives without having to attend with their parents. Health talks at school can also help adolescents to overcome the asymmetries of information about the existence of these free services as well as to overcome the psychosocial barriers that impede them to use those public benefits.

***It is necessary to take into account the cultural aspect of teen pregnancy***

This study shows that higher school gains are consistent with positive improvements on the use of contraceptives among females, with reductions in the likelihood of having an unplanned pregnancy. Nevertheless, it also showed that in some cases, adolescents may also want to get pregnant. Higher schooling completion, health talks or access to cash and information might be enough to stop pregnancy during adolescence. Policy makers need to be aware that teen pregnancy might not only be the result of accidents and lack of information about existing contraceptive methods. It seems that a cultural factor might be playing an important role on the normalization and reproduction of early pregnancies. First, motherhood seems to give a higher status to adolescents, and teen pregnancy seems to be increasingly normalized by the frequency of relatives, siblings, neighbors and classmates getting pregnant at an early age. Furthermore, girls dating older partners might be more likely to get pregnant in order to be allowed by the parents to move in with their boyfriends (Carvacho et al., 2008). Further research with qualitative methods using in depth interviews would be useful to better understand the dynamics and rationale of adolescents with regards to teen pregnancy.

***Additional security and resources should be given to schools located in Favelas affected by violence***

Public policy needs to address issues of security and violence in *Favelas* and perform additional research into its relationship with dropouts and lower schooling outcomes, particularly among males. Studies have found that many children and adolescents living in Brazilian *Favelas* stop studying due to fear or armed groups, drug micro-trafficking and frequent death of community members (Soares et al., 2009). Furthermore, studies suggest that adolescents and young adults are marked in the labor market with “*Favela* prejudice” since employers might be afraid that job candidates are or have been involved with violent groups (Soares et al., 2009). Although CCTs might improve schooling and risky behavior

outcomes, they do not reduce in the short term the negative effects of the *Favelas*. That is why additional investments in security and resources on education, as well as psychological follow ups at school, need to be made in conflict zones or locales recently pacified, so that children and adolescents feel safe to walk in their own neighborhood and to attend school.

### **Concluding Remarks**

Conditional Cash Transfers are important and necessary incentives to achieving greater educational equality and increasing future earnings of youth from low socio-economic backgrounds. Expanding the knowledge on the role of incentives on youth behavior and decision-making is crucial to improving existing public policies in education, labor market and health targeting adolescents in low-income countries, particularly in Latin America. Direct cash incentives or direct non-monetary incentives to adolescents are an efficient tool to allocate their time in a way that increases their likelihood of attaining higher degrees of education, obtaining better jobs and increased future earnings.

There are some limitations to this study that need to be acknowledged. As explained previously, in the absence of program randomization, as well as working with matched non-experimental data, it is likely that unobservable characteristics that influence placement of adolescents in the Young Agent Program might also affect the outcomes. Given the data and program constraints, and as shown with the robustness checks, evidence suggests that Propensity Score Matching is doing a good job evaluating the effects of the Young Agent Project and correcting for at least some of the selection bias. Some improvements could be done to surveys studying issues dealing with adolescents. For example, studies of the work participation of women do not take into consideration domestic duties that are more likely to be performed by females. Furthermore, in order to secure more accurate information about time allocation, surveys should include more specific questions about the approximate number of hours and characteristics of each task, including idleness. When surveying

adolescents, it is important that parents are not present during the time of the questionnaire implementation. Fear of the parents within very sensitive topics such as how money is spent, sexuality, use of drugs and alcohol, and planned or unplanned pregnancy could result in erroneous information given by adolescents if they are present.

Surveys evaluating CCTs would benefit from the introduction of variables that measure cognitive skills (e.g., test scores from *Prova Brasil*) and non-cognitive skills. The YAP After School Program activities could have positive effects on education attainment and labor outcomes by improving non-cognitive outcomes highly valued in the labor market such as time management skills, reliance, problem solving, teamwork, the ability to follow directions, being able to work in teams, interpersonal communication, taking personal responsibility and personal discipline. At the same time, this literature is in its early stages of development and an ideal framework to explain the connection between non-cognitive skills and other outcomes has not yet been designed.

In sum, more research needs to be done to understand and address the problem of idle youth. If social or economic forces are driving the young out of school and into idleness such as teen pregnancy, lack of opportunities and extreme poverty, what can be done to prevent it? Further research needs to be done in order to better understand what leads young people to inactivity. Furthermore, in order to secure more accurate information on the nature of idleness and the combination of schooling vs. labor, surveys should include information about domestic duties and questions about the number of hours dedicated to each activity. In order to glean greater insight on adolescents' rationality (or irrationality), program evaluations should draw up both a quantitative section that measures the outcomes, and a qualitative section set off with in depth interviews. Issues such as adolescents' priorities in time allocation, their future aspirations, the role of the community and peers on their outcomes cannot really be measured or explained using inferential statistics only.



Further research with both quantitative and qualitative methods should address some questions that remain unanswered: Why, for example, some females stay at home taking care of elderly relatives or younger children instead of studying or working? Why are some adolescents choosing to be idle? Do they even think they have a choice? How does daily violence in the *Favelas* affect adolescents' decisions and time allocation patterns? Why do some adolescents want to be pregnant at such an early age? How hard is it to combine school and work? What cognitive and non-cognitive skills could be developed or reinforced by the combination of schooling and labor? All of these issues deserve greater insight than is presently available.

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## APPENDICES

## Appendix A - Map Brazilian regions by GDP

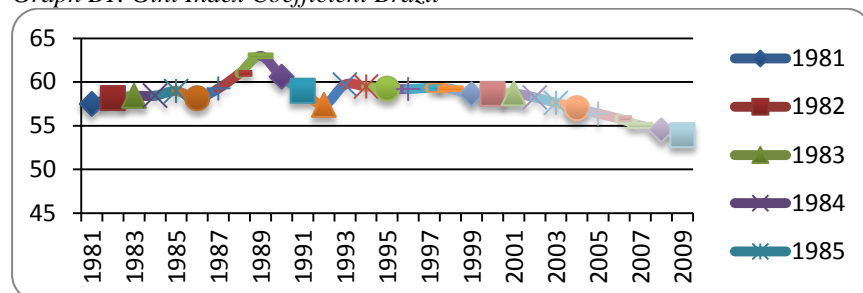


■	+ 1 trillion (Southeast) → 1.698.590.000
■	+ 500 billions (South) → 502.052.000
■	+ 300 billions (Northeast) → 397.503.000
■	+ 200 billions (Center –West) → 279.015.000
■	+ 100 billions (North) → 154.705.000

\*GDP mil in Brazilian Reais / Source: IBGE 2008

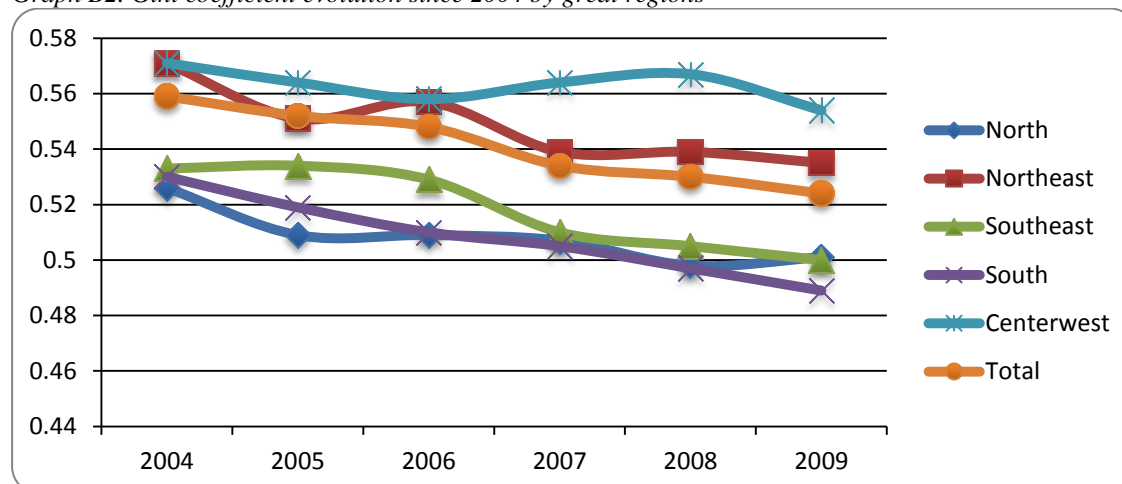
## Appendix B. Background Information about Brazil

Graph B1. Gini Index Coefficient Brazil



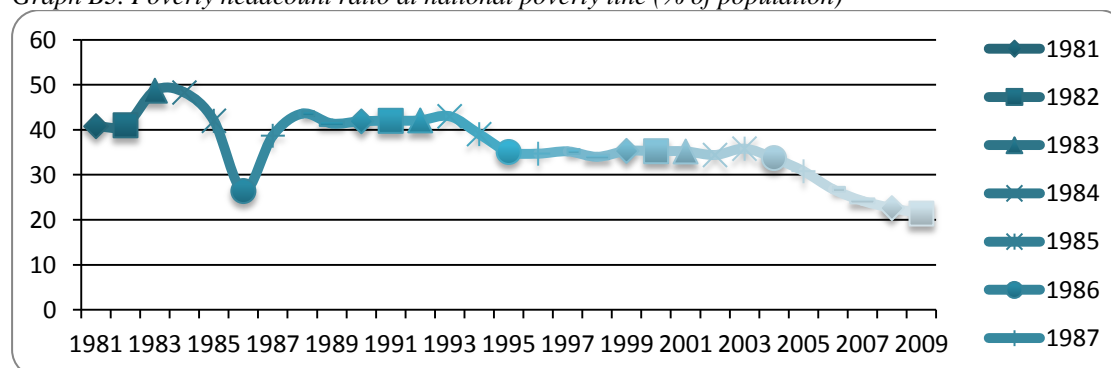
Source: The World Bank, World Development Indicators

Graph B2. Gini coefficient evolution since 2004 by great regions



Source: IBGE/PNAD 2009.

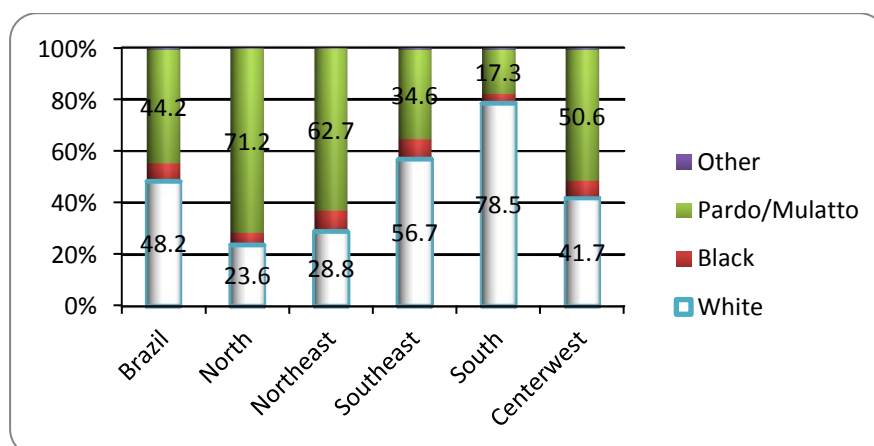
Graph B3. Poverty headcount ratio at national poverty line (% of population)



Source: The World Bank, World Development Indicators

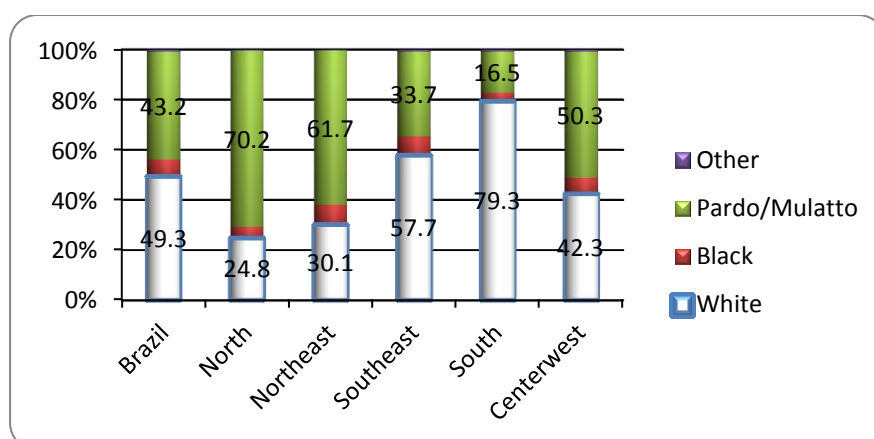


Graph B4. Racial Inequalities in Brazil: Racial composition by great regions



Source: IBGE/PNAD 2009.

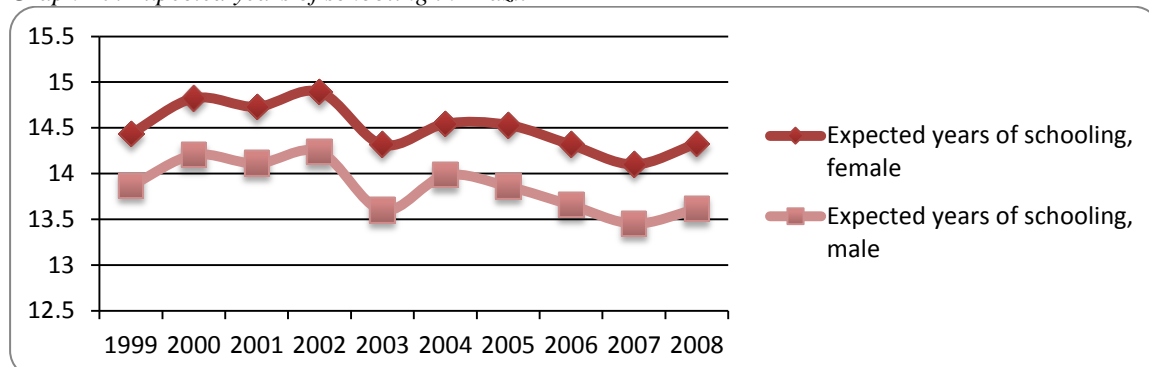
Graph B5. Gender Inequalities in Brazil: Racial composition of women by great regions



Source: IBGE/PNAD 2009.

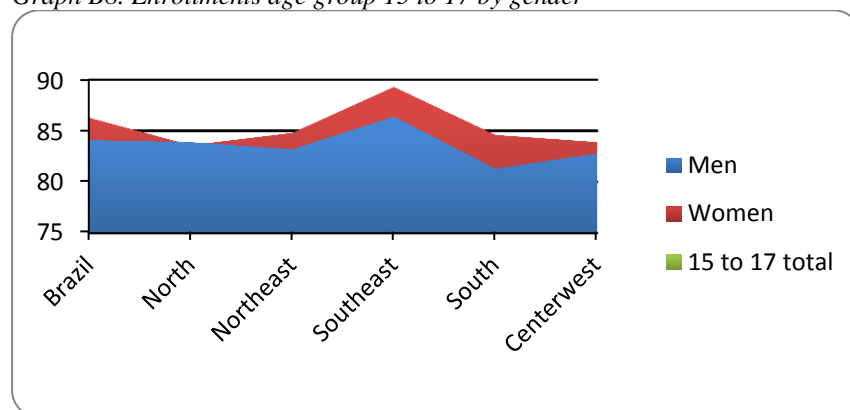
## EDUCATION

Graph B7. Expected years of schooling in Brazil



Source: The World Bank, World Development Indicators

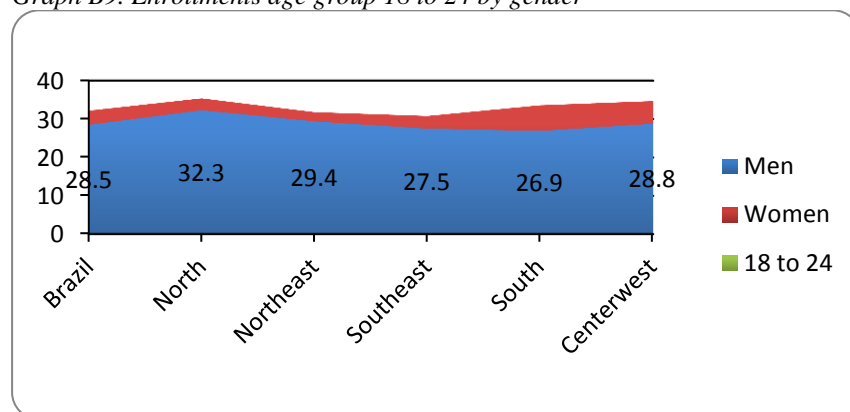
Graph B8. Enrollments age group 15 to 17 by gender



Age and gender	Brazil	North	Northeast	Southeast	South	Center-west
Men	84.1	83.9	83.2	86.4	81.3	82.8
Women	86.3	83.6	84.8	89.3	84.6	83.9
15 to 17 total	85.2	83.8	84	87.8	82.9	83.3

Source: IBGE/PNAD 2009

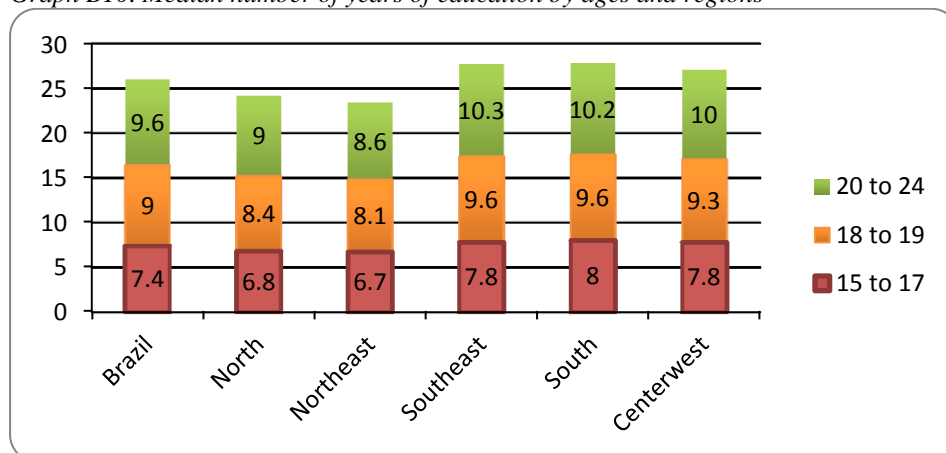
Graph B9. Enrollments age group 18 to 24 by gender



Age and gender	Brazil	North	Northeast	Southeast	South	Center-west
Men	28.5	32.3	29.4	27.5	26.9	28.8
Women	32.2	35.4	31.8	30.8	33.6	34.7
18 to 24	30.3	33.9	30.6	29.1	30.2	31.8

Source: IBGE/PNAD 2009

Graph B10. Median number of years of education by ages and regions

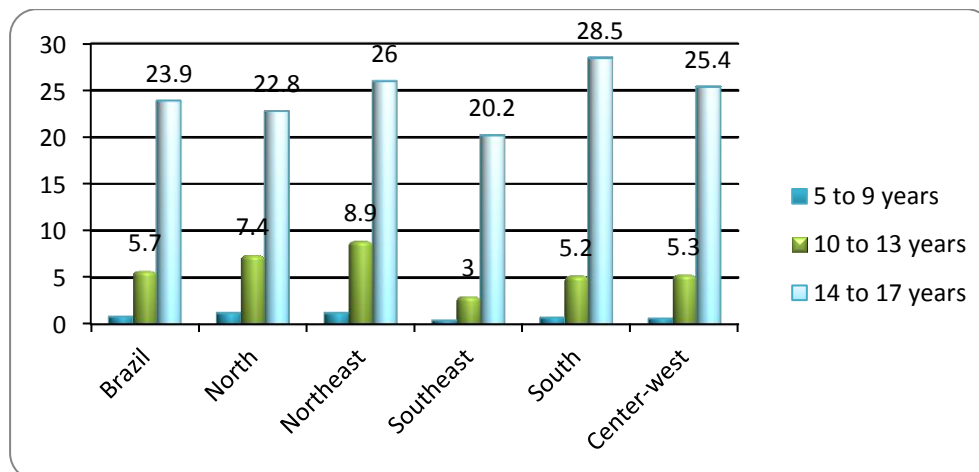


Age groups	Brazil	North	Northeast	Southeast	South	Center west
15 to 17	7.4	6.8	6.7	7.8	8	7.8
18 to 19	9	8.4	8.1	9.6	9.6	9.3
20 to 24	9.6	9	8.6	10.3	10.2	10

Source: IBGE/PNAD 2009

## 5. LABOR

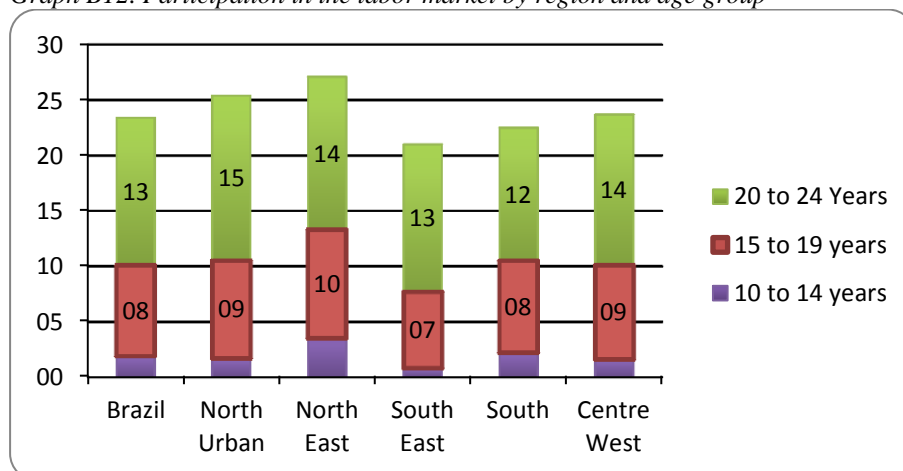
Graph B11. Children and adolescents in the great regions working



Child labor	Brazil	North	Northeast	Southeast	South	Center west
5 to 9 years	0.8	1.2	1.2	0.4	0.7	0.6
10 to 13 years	5.7	7.4	8.9	3	5.2	5.3
14 to 17 years	23.9	22.8	26	20.2	28.5	25.4

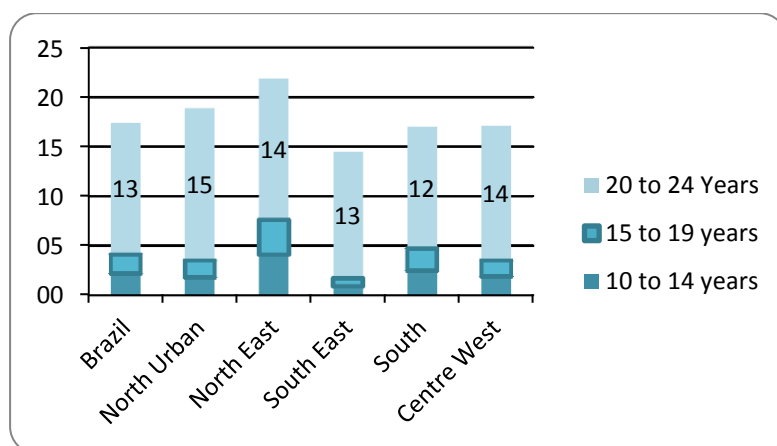
Source: IBGE/PNAD 2009

Graph B12. Participation in the labor market by region and age group



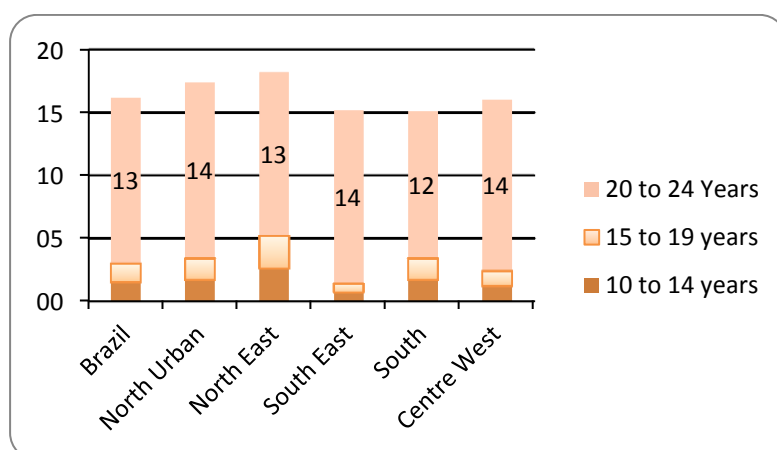
Source: IBGE/PNAD 2007

Graph B13. Participation in the labor market by men



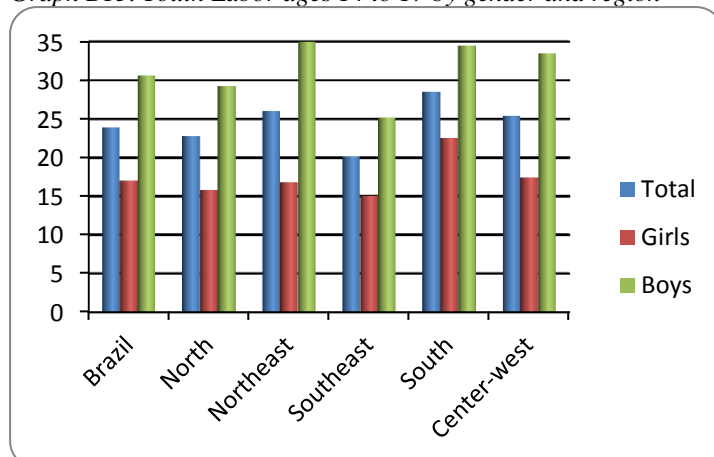
Source: IBGE/PNAD 2007

Graph B14. Participation in the labor market by woman



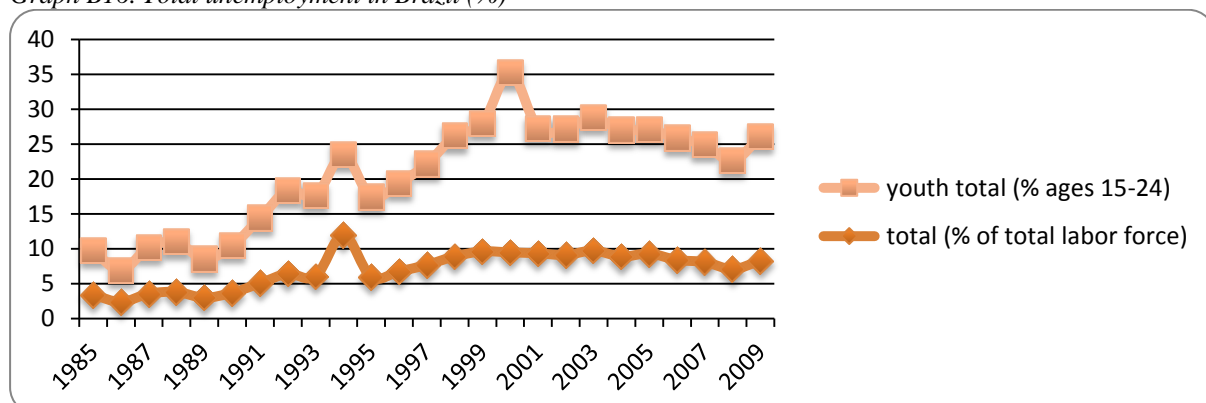
Source: IBGE/PNAD 2007

Graph B15. Youth Labor ages 14 to 17 by gender and region



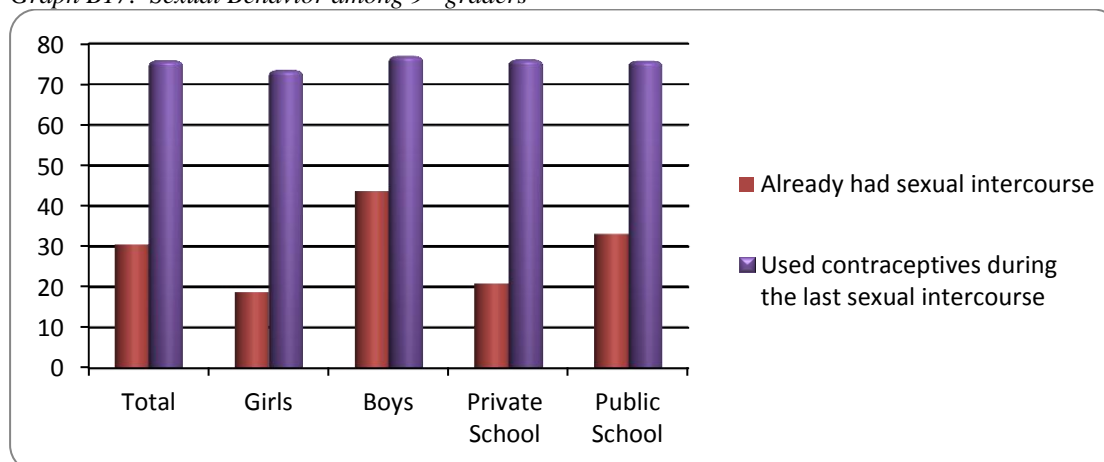
Source: IBGE/PNAD 2009

Graph B16. Total unemployment in Brazil (%)



Source: The World Bank. World Development Indicators

## 6. SEXUAL BEHAVIORS AND EARLY PREGNANCY

Graph B17. Sexual Behavior among 9<sup>th</sup> graders

	Total	Girls	Boys	Private School	Public School
Already had sexual intercourse	30.5	18.7	43.7	20.8	33.1
Used contraceptives during the last sexual intercourse	75.9	73.5	77	76.1	75.8

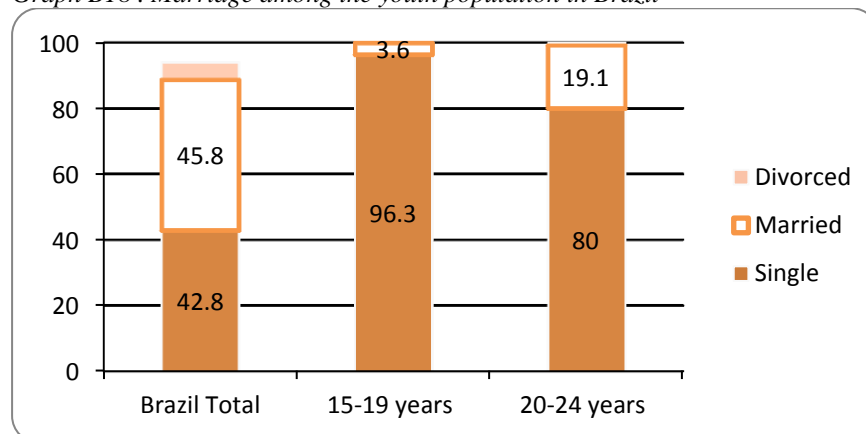
Source: IBGE/PeNSE. 2009

Table B1. Sexual orientation and information at school among 9<sup>th</sup> graders

	Private School	Public School
Received information in school about STDs	89.4	87.5
Received Information in school about early pregnancy prevention	81.1	81.1
Received information in school about how to obtain free contraceptives	65.4	71.4

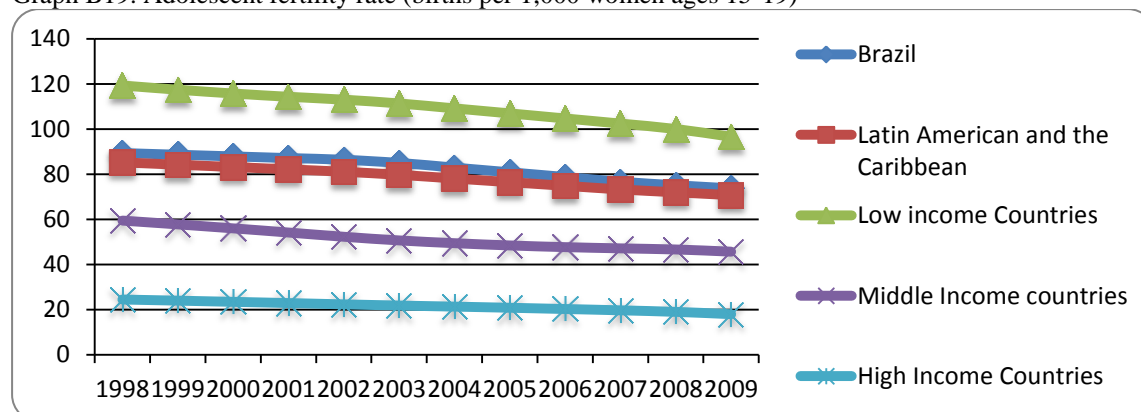
Source: IBGE/PeNSE, 2009

Graph B18. Marriage among the youth population in Brazil



Source: IBGE/PNAD 2009.

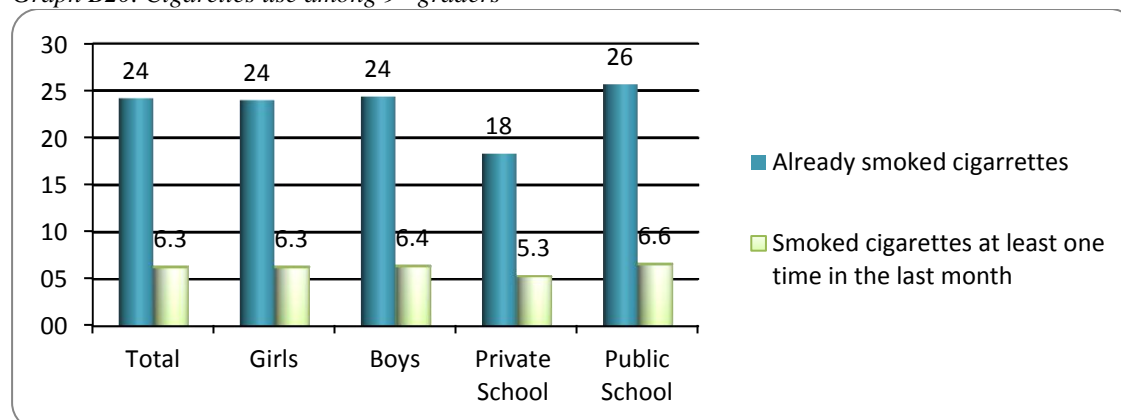
Graph B19. Adolescent fertility rate (births per 1,000 women ages 15-19)



Source: The World Bank, World Development Indicators

## 7. YOUTH USE OF CIGARRETTES, DRUGS AND ALCOHOL

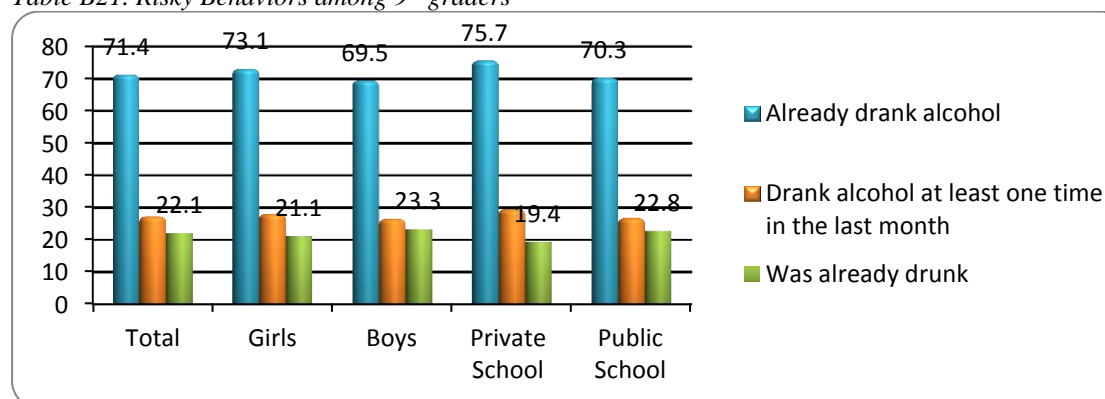
Graph B20. Cigarettes use among 9<sup>th</sup> graders



	Total	Girls	Boys	Private School	Public School
Already smoked cigarettes	24.2	24.0	24.4	18.3	25.7
Smoked cigarettes at least one time in the last month	6.3	6.3	6.4	5.3	6.6

Source: IBGE/PeNSE, 2009

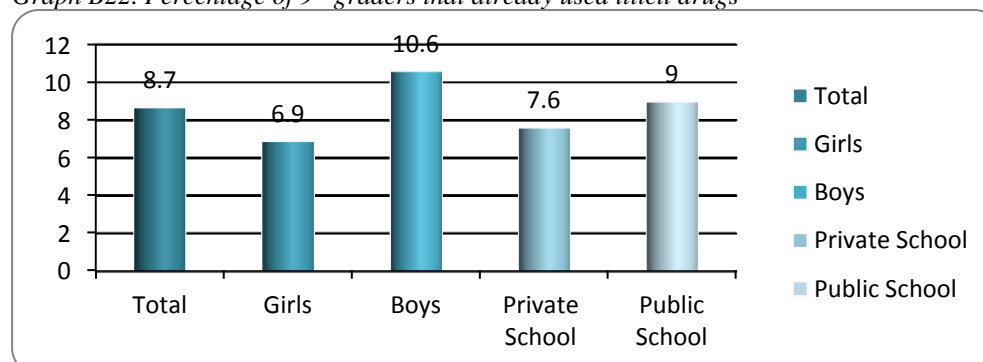
Table B21. Risky Behaviors among 9<sup>th</sup> graders



	Total	Girls	Boys	Private School	Public School
Already drank alcohol	71.4	73.1	69.5	75.7	70.3
Drank alcohol at least one time in the last month	27.3	28.1	26.5	29.5	26.8
Was already drunk	22.1	21.1	23.3	19.4	22.8

Source: IBGE/PeNSE, 2009

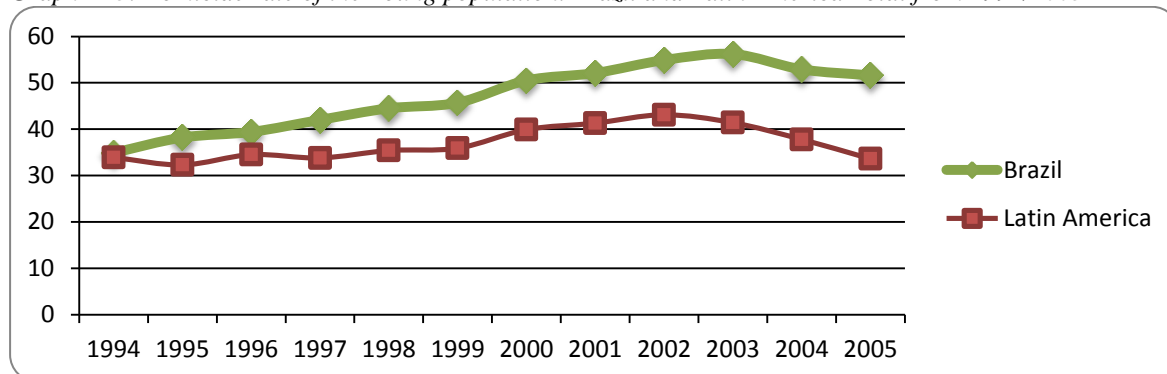
Graph B22. Percentage of 9<sup>th</sup> graders that already used illicit drugs



Source: IBGE/PeNSE, 2009

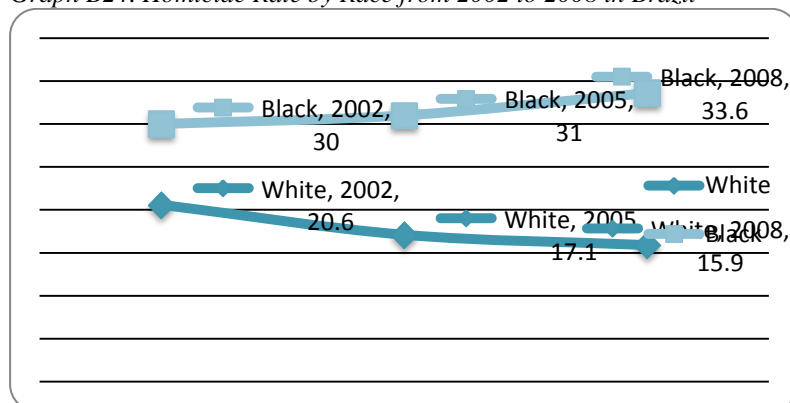
## 8. YOUTH AND VIOLENCE

Graph B23. Homicide rate of the Young population. Brazil and Latin America Total from 1994/2005



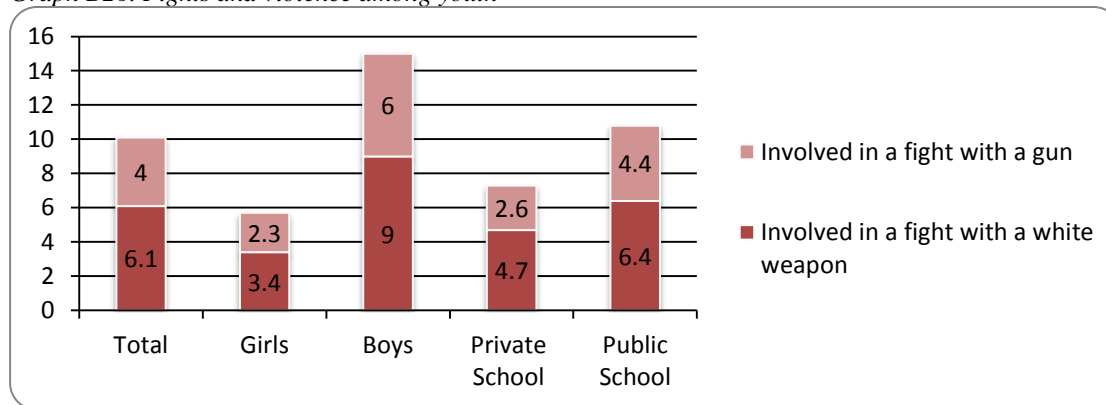
Source: WHOSIS 2009 in Waiselfisz, 2011

Graph B24. Homicide Rate by Race from 2002 to 2008 in Brazil



Source: WHOSIS 2009 in Waiselfisz, 2011

Graph B26. Fights and violence among youth

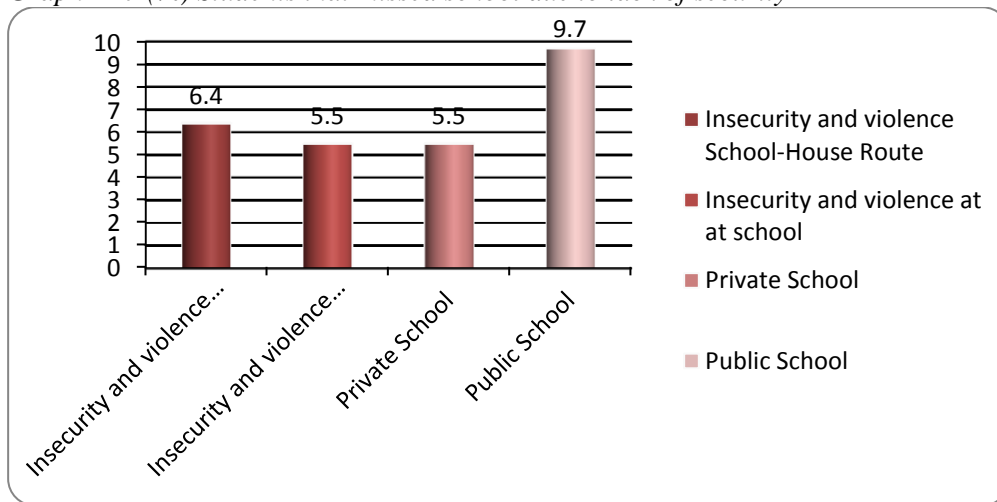


	Total	Girls	Boys	Private School	Public School
Involved in a fight with a white weapon	6.1	3.4	9	4.7	6.4
Involved in a fight with a gun	4	2.3	6	2.6	4.4

Source: IBGE/PeNSE, 2009



Graph B27 (%) Students that missed school due to lack of security



Source: IBGE/PeNSE, 2009

## Appendix C – Literature Review Comparative Tables of CCTs’ Impact Evaluation

Table B1

*Evidence of the effects of CCTs and ASPs on schooling outcomes*

Program	Methodology	Results	Source
<p><b>PROGRESA/ Oportunidades (Mexico)</b></p>	<p>Difference in Difference DD</p> <p>Randomized Assignment</p>	<p>7 and 9 percentage point increase enrolments for girls a 5 and 6 percentage point increase for boys in the transition from elementary school to junior high</p> <p>Children (6 to 10) experience large reductions in grade repetition and better grade progression</p> <p>Children with a year and a half more of benefits, achieve 0.2 grades of additional schooling</p>	<p>Schultz (2004),</p> <p>Berhman, Sengupta &amp; Todd (2005)</p>
<p><b>Jovenes con Oportunidades (Mexico)</b></p>		<p>School dropouts of teenagers 16 and 19 years old decreased 23 percent. After two years of awarding grants at these levels, high school enrollment increased by 85 percent</p> <p>Positive increase on enrollments ranging from 3.5 to 5.8 percent for boys and 7.2 to 9.3 percent for girls</p> <p>Increased enrollment for young entering secondary school by over 20 percent for girls and 10 percent for boys</p>	<p>Parker &amp; Todd (2005)</p> <p>The World Bank, (2007).</p> <p>Rawlings &amp; Rubio (2005)</p> <p>Skoufias, 2003</p>
<p><b>Bolsa Escola/ Bolsa Familia (Brazil)</b></p>	<p>Quasi-experimental design. Randomized</p> <p>Propensity Score Matching</p>	<p>60 percent of poor, 10 – 15 years old, drop out of school and re-enrolled in school in response to the conditional cash transfer</p> <p>3 percent increase in school attendance of the treated boys and girls with respect to the control group</p> <p>Dropouts decreased for girls in the Northern Central region and boys in the Southeastern region</p>	<p>Bourguignon et al., (2003)</p> <p>Cardoso &amp; Portela Souza (2004)</p> <p>De Oliveira et al., (2007)</p>
<p><b>PETI (Brazil)</b></p>			
<p><b>Chile Solidario (Chile)</b></p>	<p>Experimental design RDD methods</p>	<p>Enrollment increased 7.5 percentage points and the probability that all children aged 6–14, are enrolled in school</p>	<p>Galasso (2006)</p>

<b>Familias en Accion (Colombia)</b>	Propensity Score Matching And Difference in Difference DD	School enrollments of children, ages 8-13, increased by 2 percentage points and by 6 percentage points for ages 14 to 17	Attanasio, Fitzsimmons & Gomez, 2005
<b>Bono de Desarrollo Humano (BDH)  (Ecuador)</b>	Randomized evaluation and Instrumental ( IV) methods	Increased by 10 percentage points the school enrollment of children and adolescents from 6 to 17 years of age	Schady & Araujo (2008)
<b>Nicaraguan, Red de Protección Social (RPS) (Nicaragua)  Atención Crisis (Nicaragua)</b>	Randomized evaluation	Increased enrollment by 13 percent and school attendance by 20 percent for age groups 7 to 15.  Increased enrollments by 7 percent for age groups 13 t 15.	Maluccio & Flores (2005)  Marcours & Vakis (2008)
<b>Programa de Asignación Familiar (PRAF) (Honduras )</b>	Randomized evaluation	Increased enrollment by 3 percentage points for the age group 6 to 13.Increased school attendance by about 0.8 days per month and increased annual promotion rates to the next grade by 2-4 percentage points	Glewwe & Olinto (2004)

Table B2

*Evidence of the effects of CCTs and ASPs on Child Labor*

<b>Program</b>	<b>Methodology</b>	<b>Results</b>	<b>Source</b>
<b>PROGRESA/ Oportunidades (Mexico)</b>	Randomized Evaluation Difference-in-difference	Boys aged 15 to 16 years (9-10 pre-program) had a reduction of almost 30 percent in the probability of working. Girls aged 13 to 15 years of age, pre-program (19-21 post program), showed a 6 percentage points increase labor  Girls aged 14 to 15 showed reductions of between 2.6 and 3.9 percentage points. Between 5 and 10 percent reductions in domestic work for girls.	Berhman, Parker & Todd (2007)  Skoufias & Parker (2001)
<b>Nicaraguan, Red de Protección Social (RPS) (Nicaragua)</b>	Randomized evaluation	Reduced the percentage of working children aged 7 to 13 by 5.6 percent and that impacts were larger for extremely poor households and for boys.	Maluccio & Flores (2005)
<b>Bono de Desarrollo Humano (BDH)  (Ecuador)</b>	Randomized evaluation	41 percent reduction in child labor	Edmons & Schady (2009)
<b>Bolsa Escola/Bolsa Familia (Brazil)  PETI (CCT and ASP) (Brazil)</b>	Quasi-Experimental Propensity Score Matching	No significant effect on child labor reduction  The probability of working among the participating children aged 7-14 decreased from 17 percent to 10-13 percent in Pernambuco, from 17 percent to 4 percent in Sergipe, and, dramatically, from 38 percent to 12 percent in Bahia	Cardoso & Portela Souza (2004)  Yap et al. (2001)

## Appendix D – Data and Methods

### Descriptive statistics covariates

Table D1

#### *Means and Standard deviations*

	Total		Control Group		Treatment Group (All)		Cash To Adolescents		Cash To Parents		High Dosage		Medium Dosage		Low Dosage	
	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd
<u>Covariates</u>																
Women	0.52	0.50	0.54	0.50	0.51	0.50	0.52	0.50	0.49	0.50	0.51	0.50	0.51	0.50	0.51	0.50
Age	17.68	0.96	17.49	1.06	17.74	0.93	17.76	0.93	17.69	0.90	17.67	0.94	17.74	0.93	17.85	0.87
Socio Economic Status Education Attainment	1.34	0.62	1.36	0.58	1.34	0.63	1.33	0.63	1.35	0.64	1.34	0.65	1.33	0.62	1.36	0.59
Mother Children 0 to 14 in the Household	2.27	1.51	2.47	1.61	2.21	1.48	2.19	1.47	2.24	1.51	2.16	1.56	2.22	1.42	2.29	1.43
Started Working Before 15 Mother is Responsible Household	0.65	0.48	0.63	0.48	0.66	0.47	0.66	0.47	0.66	0.48	0.66	0.47	0.66	0.47	0.67	0.47
Household	15.74	0.77	15.75	0.72	15.73	0.78	15.76	0.74	15.66	0.86	15.72	0.76	15.70	0.88	15.82	0.62
Household	0.43	0.49	0.38	0.49	0.44	0.50	0.45	0.50	0.41	0.49	0.44	0.49	0.42	0.49	0.48	0.50
<u>Regions</u>																
Northeast Region	0.27	0.44	0.26	0.44	0.27	0.44	0.19	0.39	0.51	0.50	0.28	0.45	0.33	0.47	0.15	0.35
Southeast Region	0.45	0.50	0.40	0.49	0.46	0.50	0.56	0.50	0.14	0.34	0.45	0.49	0.37	0.48	0.61	0.49
North Region	0.12	0.32	0.13	0.34	0.11	0.32	0.11	0.32	0.11	0.31	0.07	0.25	0.15	0.36	0.13	0.34
Center West Region	0.11	0.31	0.12	0.33	0.11	0.31	0.09	0.28	0.16	0.37	0.15	0.36	0.10	0.31	0.04	0.19
Southern Region	0.06	0.24	0.08	0.27	0.06	0.24	0.05	0.22	0.08	0.28	0.06	0.23	0.05	0.22	0.08	0.27
Number of Observations	2180		495		1688		1262		403		666		627		395	

Note: Sd: Standard deviations. The number of observations refer to the different samples. Regions refer to the models used for the sensitivity analysis that include region dummies as covariates.

## Samples and Subsamples

### *Subgroup Analysis – Women and Men Represented in the Sample*

	Women	Men
TREATMENT Group	860	828
CONTROL Group	266	229
Total	1126	1050

### *Subgroup Analysis - Regions Represented in the Sample*

REGIONS	TREAT	CONTROL	Total
North	190	65	255
<b>Northeast</b>	<b>448</b>	<b>131</b>	<b>579</b>
Center West	178	60	238
<b>Southeast</b>	<b>773</b>	<b>199</b>	<b>972</b>
South	99	40	139
<b>TOTAL</b>	<b>1688</b>	<b>495</b>	<b>2183</b>

*Subgroup Analysis – All Dosage groups by hours and percentage*

Hours/Week	Frequency	Percent
<b>Low Dosage (&lt;50)</b>		
2	2	0.12
3	8	0.47
4	34	2.01
5	6	0.35
6	87	5.14
7	2	0.12
8	55	3.25
9	201	11.87
Total	395	23.33
<b>Medium Dosage (&gt;50&lt;70)</b>		
10	27	1.59
12	248	14.65
15	352	20.79
Total	632	37.33
<b>High Dosage (&gt;80%)</b>		
16	128	7.56
18	4	0.24
20	442	26.11
21	6	0.35
24	2	0.12
25	50	2.95
28	21	1.24
30	7	0.41
35	6	0.35
Total	666	39.34

*Outcome Missing Values*

Covariate	Number of values missing	Percentage of the total sample
Education attainment of the household responsible	15	0.69
Number of children bellow 15 years living in the household	6	0.28
Adolescents that started working befo the age of 16	5	0.23

## Appendix F - Propensity Score Matching Balances and Histograms

### 1. General sample and subsamples

#### *Gender Subgroup - Females*

Covariate	Sample	Mean		SD	
		Treated	Control	Treated	Control
TREAT	Unmatched	1	0	0.0	0.0
	Matched	1	0	0.0	0.0
AGE	Unmatched	17.75	17.43	0.9	1.1
	Matched	17.75	17.76	0.9	1.0
SESTATUS	Unmatched	1.34	1.32	0.6	0.6
	Matched	1.34	1.28	0.6	0.5
Education Attainment Head Household	Unmatched	2.24	2.48	1.5	1.6
	Matched	2.24	2.05	1.5	1.4
CHILDREN 0 to 16 in the Household	Unmatched	0.67	0.67	0.5	0.5
	Matched	0.67	0.71	0.5	0.5
Started Working before 15	Unmatched	15.8	15.8	0.7	0.5
	Matched	15.8	15.9	0.7	0.3
Responsible of the Household is the Mother	Unmatched	0.46	0.39	0.5	0.5
	Matched	0.46	0.41	0.5	0.5



*Gender Subgroup - Males*

Covariate	Sample	Mean		SD	
		Treated	Control	Treated	Control
TREAT	Unmatched	1	0	0.0	0.0
	Matched	1	0	0.0	0.0
AGE	Unmatched	17.73	17.56	0.9	1.0
	Matched	17.73	17.76	0.9	1.0
SESTATUS	Unmatched	1.34	1.41	0.6	0.6
	Matched	1.34	1.38	0.6	0.6
Education Attainment Head Household	Unmatched	2.18	2.45	1.5	1.6
	Matched	2.18	2.13	1.5	1.4
CHILDREN 0 to 16 in the Household	Unmatched	0.65	0.59	0.5	0.5
	Matched	0.65	0.66	0.5	0.5
Started Working before 15	Unmatched	15.66	15.65	0.9	0.9
	Matched	15.66	15.78	0.9	0.6
Responsible of the Household is the Mother	Unmatched	0.43	0.36	0.5	0.5
	Matched	0.43	0.38	0.5	0.5

*Ethnicity Subgroup White Individuals subsample*

Covariate	Sample	Mean		SD	
		Treated	Control	Treated	Control
TREAT	Unmatched	1	0	0.0	0.0
	Matched	1	0	0.0	0.0
WOMAN	Unmatched	0.51	0.51	0.5	0.5
	Matched	0.51	0.55	0.5	0.5
AGE	Unmatched	17.6	17.5	0.9	1.1
	Matched	17.6	17.6	0.9	1
SESTATUS	Unmatched	1.35	1.40	0.6	0.5
	Matched	1.35	1.34	0.6	0.5
Education Attainment Head Household	Unmatched	2.36	2.40	1.6	1.6
	Matched	2.36	2.35	1.6	1.7
CHILDREN 0 to 16 in the Household	Unmatched	0.65	0.60	0.5	0.5
	Matched	0.65	0.64	0.5	0.5
Started Working before 15	Unmatched	15.79	15.72	0.6	0.8
	Matched	15.79	15.81	0.6	0.6
Responsible of the Household is the Mother	Unmatched	0.38	0.40	0.5	0.5
	Matched	0.38	0.34	0.5	0.5

*Ethnicity Subgroup Pardo Individuals subsample*

Covariate	Sample	Mean		SD	
		Treated	Control	Treated	Control
TREAT	Unmatched	1	0	0.0	0.0
	Matched	1	0	0.0	0.0
WOMAN	Unmatched	0.52	0.55	0.50	0.50
	Matched	0.52	0.52	0.50	0.50
AGE	Unmatched	17.75	17.49	0.90	1.10
	Matched	17.75	17.83	0.90	1.10
SESTATUS	Unmatched	1.31	1.36	0.60	0.60
	Matched	1.31	1.31	0.60	0.60
Education Attainment Head Household	Unmatched	2.20	2.50	1.50	1.60
	Matched	2.20	2.27	1.50	1.40
CHILDREN 0 to 16 in the Household	Unmatched	0.65	0.63	0.50	0.50
	Matched	0.65	0.65	0.50	0.50
Started Working before 15	Unmatched	15.71	15.78	0.80	0.60
	Matched	15.71	15.80	0.80	0.60
Responsible of the Household is the Mother	Unmatched	0.45	0.38	0.50	0.50
	Matched	0.45	0.44	0.50	0.50

*Ethnicity Subgroup Black Individuals subsample*

Covariate	Sample	Mean		SD	
		Treated	Control	Treated	Control
TREAT	Unmatched	1	0	0.0	0.0
	Matched	1	0	0.0	0.0
WOMAN	Unmatched	0.51	0.54	0.50	0.50
	Matched	0.51	0.52	0.50	0.50
AGE	Unmatched	17.80	17.42	1.00	0.90
	Matched	17.80	17.69	1.00	0.90
SESTATUS	Unmatched	1.36	1.36	0.60	0.60
	Matched	1.36	1.40	0.60	0.50
Education Attainment Head Household	Unmatched	2.18	2.38	1.40	1.60
	Matched	2.18	2.14	1.40	1.50
CHILDREN 0 to 16 in the Household	Unmatched	0.71	0.64	0.50	0.50
	Matched	0.71	0.73	0.50	0.40
Started Working before 15	Unmatched	15.78	15.77	0.70	0.60
	Matched	15.78	15.87	0.70	0.50
Responsible of the Household is the Mother	Unmatched	0.53	0.40	0.50	0.50
	Matched	0.53	0.62	0.50	0.50

*Regional Subgroup – Southeast Region*

Covariate	Sample	Mean		SD	
		Treated	Control	Treated	Control
TREAT	Unmatched	1	0	0.0	0.0
	Matched	1	0	0.0	0.0
WOMAN	Unmatched	0.54	0.56	0.50	0.50
	Matched	0.54	0.50	0.50	0.50
AGE	Unmatched	17.78	17.55	0.90	1.00
	Matched	17.78	17.81	0.90	0.90
SESTATUS	Unmatched	1.31	1.42	0.60	0.60
	Matched	1.31	1.34	0.60	0.50
Education Attainment Head Household	Unmatched	2.23	2.19	1.40	1.50
	Matched	2.23	2.10	1.40	1.30
CHILDREN 0 to 16 in the Household	Unmatched	0.67	0.59	0.50	0.50
	Matched	0.67	0.64	0.50	0.50
Started Working before 15	Unmatched	15.78	15.78	0.70	0.70
	Matched	15.78	15.65	0.70	1.00
Responsible of the Household is the Mother	Unmatched	0.49	0.43	0.50	0.50
	Matched	0.49	0.51	0.50	0.50

*Regional Subgroup – Northeast Region*

Covariate	Sample	Mean		SD	
		Treated	Control	Treated	Control
TREAT	Unmatched	1	0	0.0	0.0
	Matched	1	0	0.0	0.0
WOMAN	Unmatched	0.50	0.54	0.50	0.50
	Matched	0.50	0.52	0.50	0.50
AGE	Unmatched	17.69	17.28	0.90	1.20
	Matched	17.69	17.85	0.90	1.20
SESTATUS	Unmatched	1.35	1.34	0.60	0.60
	Matched	1.35	1.45	0.60	0.60
Education Attainment Head Household	Unmatched	1.90	2.35	1.50	1.60
	Matched	1.90	1.90	1.50	1.50
CHILDREN 0 to 16 in the Household	Unmatched	0.65	0.61	0.50	0.50
	Matched	0.65	0.69	0.50	0.50
Started Working before 15	Unmatched	15.64	15.79	1.00	0.70
	Matched	15.64	15.71	1.00	0.60
Responsible of the Household is the Mother	Unmatched	0.40	0.31	0.50	0.50
	Matched	0.40	0.28	0.50	0.50

## 2. Cash Recipient balancing

*Cash recipient subsample – Cash to adolescents*

Covariate	Sample	Mean		SD	
		Treated	Control	Treated	Control
TREAT	Unmatched	1	0	0.0	0.0
	Matched	1	0	0.0	0.0
WOMAN	Unmatched	0.52	0.54	0.50	0.50
	Matched	0.52	0.54	0.50	0.50
AGE	Unmatched	17.76	17.49	0.90	1.10
	Matched	17.76	17.79	0.90	1.00
SESTATUS	Unmatched	1.33	1.36	0.60	0.60
	Matched	1.33	1.36	0.60	0.50
Education Attainment Head Household	Unmatched	2.19	2.47	1.50	1.60
	Matched	2.19	2.13	1.50	1.50
CHILDREN 0 to 16 in the Household	Unmatched	0.66	0.63	0.50	0.50
	Matched	0.66	0.65	0.50	0.50
Started Working before 15	Unmatched	15.76	15.75	0.70	0.70
	Matched	15.76	15.83	0.70	0.60
Responsible of the Household is the Mother	Unmatched	0.45	0.38	0.50	0.50
	Matched	0.45	0.41	0.50	0.50

*Cash recipient subsample – Cash to Parents or Head of the Household*

Covariate	Sample	Mean		SD	
		Treated	Control	Treated	Control
TREAT	Unmatched	1	0	0.0	0.0
	Matched	1	0	0.0	0.0
WOMAN	Unmatched	0.49	0.54	0.50	0.50
	Matched	0.49	0.45	0.50	0.50
AGE	Unmatched	17.69	17.49	0.90	1.10
	Matched	17.69	17.78	0.90	1.00
SESTATUS	Unmatched	1.35	1.36	0.60	0.60
	Matched	1.35	1.31	0.60	0.60
Education Attainment Head Household	Unmatched	2.24	2.47	1.50	1.60
	Matched	2.24	2.30	1.50	1.40
CHILDREN 0 to 16 in the Household	Unmatched	0.66	0.63	0.50	0.50
	Matched	0.66	0.63	0.50	0.50
Started Working before 15	Unmatched	15.66	15.75	0.90	0.70
	Matched	15.66	15.75	0.90	0.70
Responsible of the Household is the Mother	Unmatched	0.41	0.38	0.50	0.50
	Matched	0.41	0.38	0.50	0.50



### 3. Program Dosage Balance

#### *High Dosage Covariates Balancing*

Covariate	Sample	Mean		SD	
		Treated	Control	Treated	Control
TREAT	Unmatched	1	0	0.0	0.0
	Matched	1	0	0.0	0.0
WOMAN	Unmatched	0.51	0.54	0.50	0.50
	Matched	0.51	0.56	0.50	0.50
AGE	Unmatched	17.67	17.49	0.90	1.10
	Matched	17.67	17.68	0.90	1.00
SESTATUS	Unmatched	1.34	1.36	0.70	0.60
	Matched	1.34	1.31	0.70	0.60
Education Attainment Head Household	Unmatched	2.16	2.47	1.60	1.60
	Matched	2.16	2.16	1.60	1.50
CHILDREN 0 to 16 in the Household	Unmatched	0.66	0.63	0.50	0.50
	Matched	0.66	0.69	0.50	0.50
Started Working before 15	Unmatched	15.72	15.75	0.80	0.70
	Matched	15.72	15.80	0.80	0.60
Responsible of the Household is the Mother	Unmatched	0.44	0.38	0.50	0.50
	Matched	0.44	0.44	0.50	0.50

*Medium Dosage Covariates Balancing*

Covariate	Sample	Mean		SD	
		Treated	Control	Treated	Control
TREAT	Unmatched	1	0	0.0	0.0
	Matched	1	0	0.0	0.0
WOMAN	Unmatched	0.51	0.54	0.50	0.50
	Matched	0.51	0.50	0.50	0.50
AGE	Unmatched	17.74	17.49	0.90	1.10
	Matched	17.74	17.69	0.90	1.00
SESTATUS	Unmatched	1.32	1.36	0.60	0.60
	Matched	1.32	1.29	0.60	0.60
Education Attainment Head Household	Unmatched	2.22	2.47	1.40	1.60
	Matched	2.22	2.10	1.40	1.40
CHILDREN 0 to 16 in the Household	Unmatched	0.66	0.63	0.50	0.50
	Matched	0.66	0.68	0.50	0.50
Started Working before 15	Unmatched	15.70	15.75	0.90	0.70
	Matched	15.70	15.75	0.90	0.70
Responsible of the Household is the Mother	Unmatched	0.42	0.38	0.50	0.50
	Matched	0.42	0.40	0.50	0.50

*Low Dosage Covariates Balancing*

Covariate	Sample	Mean		SD	
		Treated	Control	Treated	Control
TREAT	Unmatched	1	0	0.0	0.0
	Matched	1	0	0.0	0.0
WOMAN	Unmatched	0.51	0.54	0.5	0.5
	Matched	0.51	0.51	0.5	0.5
AGE	Unmatched	17.85	17.49	0.9	1.1
	Matched	17.85	17.85	0.9	1.0
SESTATUS	Unmatched	1.34	1.36	0.6	0.6
	Matched	1.36	1.34	0.6	0.6
Education Attainment Head Household	Unmatched	2.29	2.47	1.4	1.6
	Matched	2.29	2.33	1.4	1.4
CHILDREN 0 to 16 in the Household	Unmatched	0.67	0.63	0.5	0.5
	Matched	0.67	0.72	0.5	0.5
Started Working before 15	Unmatched	15.82	15.75	0.6	0.7
	Matched	15.82	15.85	0.6	0.4
Responsible of the Household is the Mother	Unmatched	0.48	0.38	0.5	0.5
	Matched	0.48	0.46	0.5	0.5

## Appendix G – Robustness Checks – Sensitivity Analysis

Table G1

### *Schooling and Labor Outcomes - Ethnicity Subgroup Analysis*

Outcome	White			<i>Pardos</i> (Dark)			<i>Pretos</i> (Black)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Completed Middle School	0.074 (0.068)	0.042 (0.065)	0.029 (0.061)	0.141** (0.062)	0.159*** (0.052)	0.078* (0.051)	0.155** (0.085)	0.134** (0.076)	0.097 (0.088)
Completed High School	0.130** (0.060)	0.112* (0.089)	0.027 (0.051)	0.069 (0.067)	0.072 (0.061)	0.044 (0.066)	0.004 (0.102)	-0.056 (0.096)	-0.021 (0.066)
Has College Aspirations	-0.074 (0.070)	-0.124** (0.068)	-0.042 (0.069)	0.005 (0.061)	-0.001 (0.053)	-0.023 (0.050)	-0.031 (0.088)	0.013 (0.082)	-0.023 (0.109)
Only Studying	-0.108* (0.069)	-0.100* (0.066)	-0.132** (0.066)	-0.033 (0.058)	0.004 (0.052)	-0.005 (0.050)	-0.079 (0.070)	-0.050 (0.069)	-0.081 (0.084)
Study and Work	0.226*** (0.058)	0.158** (0.062)	0.185*** (0.063)	0.131** (0.062)	0.103** (0.058)	0.088** (0.052)	0.178** (0.081)	0.083 (0.075)	0.060 (0.086)
Only Working	-0.034 (0.022)	-0.068 (0.061)	-0.087* (0.062)	0.047 (0.050)	0.011 (0.044)	0.006 (0.047)	0.023 (0.074)	0.087 (0.069)	0.129** (0.083)
Not Working and Not Studying	-0.084* (0.056)	0.011 (0.049)	0.034 (0.049)	-0.047*** (0.047)	-0.119*** (0.041)	-0.089*** (0.041)	-0.123** (0.069)	-0.121** (0.062)	-0.108** (0.074)
Working with permit ( <i>Carteira Assinada</i> )	0.084 (0.104)	0.100 (0.099)	0.088 (0.142)	0.000 (0.077)	-0.046 (0.073)	-0.047 (0.073)	0.094 (0.109)	0.110 (0.115)	0.008 (0.135)

Note \*Significant at 10%; \*\*significant at 5%; \*\*\* Significant at the 1% level. All models estimated using the same set of covariates. Young ages 16 or 17 were excluded from the sample since it would be normal that at that age they have not completed high school. Model 1 -3 from the White subgroup N = 520 and High School sample N=302. Models 1 -3 from the Pardo/dark subgroup N=1005 and High School sample N=584. Models 1 -3 from the preto/black subgroup N= 485 and High School sample N= 269. All PSM standard errors were bootstrapped.

Table G2

*Schooling and Labor Outcomes - Regional Subgroups Analysis*

Outcome	Northeast		Southeast	
	(1)	(2)	(1)	(2)
Completed Middle School	0.004 (0.082)	0.006 (0.077)	0.085* (0.058)	0.226** (0.057)
Completed High School	0.037 (0.059)	0.074 (0.062)	0.189** (0.069)	0.085 (0.074)
Has College Aspirations	0.109* (0.080)	0.156** (0.073)	-0.047 (0.061)	0.125** (0.060)
Only Studying	0.069 (0.076)	0.071 (0.074)	-0.155 (0.064)	0.012 (0.054)
Study and Work	0.112* (0.072)	0.172*** (0.069)	0.167** (0.063)	0.085* (0.061)
Only Working	-0.049 (0.063)	-0.040 (0.064)	0.056 (0.050)	0.039 (0.051)
Not Working and Not Studying	-0.132*** (0.056)	-0.060* (0.046)	-0.067* (0.054)	-0.101** (0.049)
Working with permit (Carteira Assinada)	-0.180** (0.112)	-0.141* (0.115)	-0.120* (0.079)	-0.016 (0.087)

Note \*Significant at 10%; \*\*significant at 5%; \*\*\* significant at 1%. All models estimated using the same set of covariates. All models estimated using the same set of covariates. Young ages 16 or 17 were excluded from the sample since it would be normal that at that age they have not completed high school. Model 1 -2 from the Northeast N= 579 and High School sample N= 324. Models 1 -2 from the Southeast subgroup N=972 and High School sample N=586. All PSM standard errors were bootstrapped. The Southern region, center-west and northern regions were not included in the analysis due to the small sample sizes for those regions.

Table G3

*Grade Overage Analysis – 17 years old (N=656) and 18 years olds only (N=833)*

Outcome	17 years			18 years		
	(1)	(2)	(3)	(1)	(2)	(3)
Completed Middle School	0.027 (0.097)	-0.023 (0.064)	-0.072 (0.064)	0.174* (0.091)	0.097* (0.058)	0.167** (0.070)
Completed Sophomore Year in High School	-0.097 (0.109)	-0.066 (0.071)	-0.115* (0.067)	0.186** (0.335)	0.043 (0.155)	0.122 (0.199)
Completed Junior Year in High School	<b>-0.790</b> <b>(1.327)</b>	<b>-1.157*</b> <b>(0.802)</b>	<b>-1.058</b> <b>(0.831)</b>	1.769 (1.259)	-0.243 (0.834)	1.616** (0.884)
Completed High School	–	–	–	<b>0.036</b> <b>(0.087)</b>	<b>-0.012</b> <b>(0.057)</b>	<b>0.064</b> <b>(0.059)</b>

Note \*Significant at 10%; \*\*significant at 5% \*\*\* significant at 1%. All results use bootstrapped standard errors. I excluded the models with regions due to the sample size and the low number of participants aged 17 and 18 in the southern and northern regions. Adolescents aged 16 were not included in this overage analysis due to the sample size N=260 generated very high standard errors results.

Table G4

*Sensitivity Analysis- Schooling and Labor Outcomes – Effects by Cash Transfer Recipient*

Outcome	Transfer to Adolescents			Transfer to Parents		
	(1)	(2)	(3)	(1)	(2)	(3)
Completed Middle School	0.223*** (0.046)	0.215*** (0.037)	0.124*** (0.036)	0.005 (0.048)	0.005 (0.048)	-0.002 (0.041)
Completed High School	0.130*** (0.050)	0.049* (0.042)	0.065 (0.040)	-0.083** (0.052)	-0.083** (0.052)	-0.085* (0.046)
Has College Aspirations	0.080** (0.046)	0.084*** (0.036)	0.005 (0.037)	-0.084** (0.052)	-0.084** (0.052)	-0.085* (0.046)
Only Studying	-0.031 (0.037)	-0.036 (0.035)	-0.048* (0.023)	-0.042 (0.045)	-0.042 (0.045)	-0.027 (0.038)
Study and Work	0.126*** (0.046)	0.120*** (0.035)	0.083** (0.037)	0.156*** (0.048)	0.156*** (0.048)	0.137*** (0.040)
Only Working	-0.062* (0.042)	-0.010 (0.045)	-0.027 (0.033)	-0.014 (0.042)	-0.014 (0.042)	-0.013 (0.033)
Not Working and Not Studying	-0.033*** (0.035)	-0.074*** (0.028)	-0.063*** (0.029)	-0.099*** (0.033)	-0.099*** (0.033)	-0.096*** (0.029)
Formal Job (Carteira Assinada)	-0.026 (0.055)	-0.006 (0.051)	-0.062* (0.053)	0.011 (0.067)	0.063 (0.068)	-0.022 (0.073)

Note.\*Significant at 10%; \*\*significant at 5%; All models estimated using the same set of covariates. All results use bootstrapped standard errors. Young ages 16 or 17 were excluded from the sample since it would be normal that at that age they have not completed high school. Models 1-3 transfer to adolescents N= 1757, working sample N=1085. Participants whose parents received the subsidy directly were excluded. Models 1-3 transfer to Parents N= 898, working sample N=587.

Table G5.

*Sensitivity Analysis - Risky Behavior Outcomes - Effects by Cash Transfer Recipient*

Outcome	Transfer to Adolescents			Transfer to Parents		
	(1)	(2)	(3)	(1)	(2)	(3)
Use of contraceptive methods	0.214** (0.096)	0.226* (0.085)	0.219** (0.094)	0.243** (0.123)	0.137 (0.166)	0.136 (0.113)
Early Pregnancy	0.031* (0.029)	0.063 (0.095)	0.035 (0.022)	-0.002 (0.032)	-0.004 (0.122)	-0.006 (0.029)
Unplanned Pregnancy	-0.031* (0.029)	-0.062 (0.094)	-0.026 (0.027)	-0.027 (0.032)	-0.097 (0.121)	-0.035 (0.029)
Frequency smoking cigarettes	-0.168** (0.081)	-0.202*** (0.071)	-0.178** (0.093)	-0.070 (0.097)	-0.294*** (0.092)	-0.076 (0.092)
Frequency drinking Alcohol	0.177* (0.120)	0.080 (0.068)	0.162 (0.113)	0.248** (0.160)	0.150 (0.084)	0.240* (0.141)
Currently of Drugs	-0.016* (0.015)	-0.357** (0.153)	-0.018 (0.014)	-0.005 (0.016)	-0.369* (0.208)	-0.005 (0.013)
Used drugs after the age of 16	-0.008 (0.020)	-0.048 (0.109)	-0.018 (0.019)	-0.017 (0.024)	-0.160 (0.146)	-0.013 (0.020)

Note.\*Significant at 10%; \*\*significant at 5%; All models estimated using the same set of covariates. All results use bootstrapped standard errors. Transfer to adolescents sample N= 1757. In this sample Participants whose parents received the subsidy directly were excluded. Use of contraceptive sample N=1189. This sample only includes adolescents that reported already have their first sexual relations. Models 1-3 for the transfer to Parents sample N= 898. Participants that received the subsidy directly were excluded from the sample. Models 1 -3 from using contraceptive methods only include adolescents that reported already had their first sexual relation N= 602.



## Appendix H- Treatment Effect Comparison

Table H1.

*Comparisons of Treatment Effects Schooling and Labor Outcomes - Ethnicity Subgroup Analysis*

Outcome	White			Mulattoes Pardos			Black Pretos		
	PSM	Probit/OLS	IPTW	PSM	Probit/OLS	IPTW	PSM	Probit/OLS	IPTW
Completed Middle School	0.039 (0.064)	0.163 (0.137)	0.034 (0.057)	0.177*** (0.050)	0.477*** (0.107)	0.173*** (0.051)	0.173*** (0.076)	0.277* (0.147)	0.164** (0.071)
Completed High School	0.076 (0.081)	0.326* (0.198)	0.073 (0.074)	0.099** (0.057)	0.217 (0.157)	0.083** (0.045)	0.077 (0.088)	-0.017 (0.089)	0.069 (0.055)
Has College Aspirations	-0.013 (0.066)	-0.018 (0.133)	-0.008 (0.063)	-0.010 (0.050)	-0.043 (0.107)	-0.011 (0.041)	0.154** (0.079)	0.048 (0.150)	0.150** (0.072)
Only Studying	-0.066 (0.065)	-0.166 (0.146)	-0.095* (0.054)	0.025 (0.050)	-0.054 (0.113)	0.013 (0.040)	0.021 (0.068)	-0.033 (0.167)	0.024 (0.048)
Study and Work	0.106** (0.061)	0.317** (0.134)	0.114** (0.054)	0.028 (0.062)	0.259*** (0.101)	0.034 (0.048)	0.103* (0.073)	0.182 (0.149)	0.085 (0.060)
Only Working	-0.013 (0.059)	-0.088 (0.042)	0.004 (0.047)	0.043 (0.045)	0.073 (0.102)	0.051 (0.034)	-0.010 (0.069)	-0.006 (0.069)	-0.011 (0.068)
Not Working and Not Studying	-0.026 (0.046)	-0.107 (0.049)	-0.023 (0.042)	-0.097*** (0.041)	-0.496*** (0.136)	-0.098*** (0.037)	-0.113** (0.060)	-0.192 (0.209)	-0.098** (0.046)
Working with permit ( <i>Carteira Assinada</i> )	0.100 (0.093)	0.136 (0.168)	0.113 (0.081)	-0.113** (0.069)	-0.202 (0.132)	-0.126** (0.073)	0.105 (0.113)	-0.112 (0.188)	0.072 (0.082)

Note \*Significant at 10%; \*\*significant at 5%; \*\*\* Significant at the 1% level. Each model is estimated using the same set of covariates. The samples of having a formal job and wages were restricted to those that reported being working during the month of the survey. Total working sample N=1370, Whites N=520, working N=321. Mulattoes/Pardos N=1005, working N=572, Pretos/black N=485 working N=316 Female subsample = 578. Working male subsample N= 750. All PSM standard errors were bootstrapped 1000 times.

Table H2.

*Comparisons of Treatment Effects Schooling and Labor Outcomes - Regional Subgroups Analysis*

Outcome	Northeast			Southeast		
	PSM	Probit/OLS	IPTW	PSM	Probit/OLS	IPTW
Completed Middle School	0.109* (0.072)	0.156 (0.132)	0.116* (0.068)	0.133*** (0.054)	0.449*** (0.113)	0.131** (0.054)
Completed High School	0.100* (0.031)	0.674* (0.354)	0.125*** (0.025)	0.246* (0.150)	0.118** (0.053)	0.085 (0.074)
Has College Aspirations	0.071 (0.071)	0.288** (0.135)	0.117** (0.064)	0.125** (0.060)	0.125** (0.060)	0.125** (0.060)
Only Studying	-0.107* (0.069)	-0.226 (0.157)	0.017 (0.050)	0.008 (0.118)	0.003 (0.041)	-0.017 (0.038)
Study and Work	0.141** (0.067)	0.462*** (0.145)	0.102** (0.048)	0.062* (0.055)	0.114*** (0.105)	0.070 (0.038)
Only Working	-0.009** (0.062)	-0.165 (0.164)	-0.022 (0.048)	-0.102 (0.121)	-0.015 (0.054)	-0.006 (0.035)
Not Working and Not Studying	-0.042 (0.040)	-0.162 (0.030)	-0.039 (0.036)	-0.057* (0.045)	-0.375*** (0.128)	-0.057 (0.040)
Formal Job (Carteira Assinada)	-0.063 (0.105)	-0.174 (0.192)	-0.051 (0.080)	-0.073 (0.074)	-0.112 (0.135)	-0.061 (0.067)

Note \*Significant at 10%; \*\*significant at 5%; \*\*\* significant at 1%. All models estimated using the same set of covariates. All models estimated using the same set of covariates. Young ages 16 or 17 were excluded from the sample since it would be normal that at that age they have not completed high school. Model 1 -2 from the Northeast N= 579 and High School sample N= 324. Models 1 -2 from the Southeast subgroup N=972 and High School sample N=586. All PSM standard errors were bootstrapped. The Southern region, center-west And northern regions were not included in the analysis due to the small sample sizes for those regions.

Table H3

*Comparisons of Treatment Effects Grade Overage Analysis – 17 years old (N=656) and 18 years olds only (N=833)*

Outcome	17 years			18 years		
	PSM	Probit/OLS	IPTW	PSM	Probit/OLS	IPTW
Completed Middle School	0.047 (0.065)	0.039 (0.132)	0.052 (0.059)	0.099* (0.060)	0.496*** (0.120)	0.095* (0.070)
Completed Sophomore Year in High School	-0.019 (0.073)	0.024 (0.123)	-0.012 (0.063)	0.009 (0.264)	0.244** (0.114)	0.019 (0.129)
Completed Junior Year in High School	<b>-0.340</b> <b>(0.805)</b>	<b>-0.015</b> <b>(0.128)</b>	<b>-0.209</b> <b>(0.754)</b>	0.662 (0.764)	0.182 (0.116)	0.799 (0.755)
Completed High School	–	–	–	<b>-0.025</b> <b>(0.053)</b>	<b>-0.070</b> <b>(0.128)</b>	<b>-0.014</b> <b>(0.052)</b>

Note \*Significant at 10%; \*\*significant at 5% \*\*\* significant at 1%. All results use bootstrapped standard errors. I excluded the models with regions due to the sample size and the low number of participants aged 17 and 18 in the southern and northern regions. Adolescents aged 16 were not included in this overage analysis due to the sample size N=260 generated very high standard errors results.

Table H4

*Comparisons of Treatment Effects Risky Behavior Outcomes - Subgroup 16 to 17 and 18 to 20 years Analysis*

Outcome	16 to 17 Years			18 to 20 Years		
	PSM	PROBIT	IPTW	PSM	PROBIT	IPTW
Use of contraceptive methods	0.224* (0.185)	0.199 (0.048)	0.049 (0.161)	0.286** (0.116)	0.164 (0.154)	0.276** (0.113)
Teen/Young Pregnancy	0.067*** (0.016)	0.411** (0.187)	0.074*** (0.013)	-0.009 (0.041)	-0.115 (0.109)	-0.001 (0.035)
Unplanned Pregnancy	0.028 (0.001)	0.174 (0.156)	0.020 (0.032)	-0.048* (0.036)	-0.194* (0.113)	-0.040 (0.036)
Frequency smoking cigarettes	-0.131 (0.104)	-0.117 (0.104)	-0.138 (0.124)	-0.094 (0.116)	-0.312*** (0.092)	-0.096 (0.091)
Frequency drinking Alcohol	0.297** (0.166)	0.216** (0.097)	0.281* (0.165)	-0.166 (0.161)	-0.078 (0.093)	0.151 (0.144)
Currently of Drugs	-0.024 (0.022)	0.513** (0.245)	-0.023 (0.016)	0.006 (0.019)	-0.326* (0.186)	0.006 (0.008)
Used drugs after the age of 16	0.000 (0.025)	0.235 (0.195)	0.001 (0.026)	-0.017 (0.027)	-0.170** (0.130)	-0.116 (0.024)

Note \*Significant at 10%; \*\*significant at 5%; \*\*\* Significant at the 1% level. All models estimated using the same set of covariates. All PSM standard errors were bootstrapped. Model 1 -3 for the age subgroup 16 to 17 N= 916, and use of contraceptives sample N= 540. Models 1-3 for the age subgroup 18 to 20 N=1267, and use of contraceptives sample N= 936.

Table H5

*Comparisons of Treatment Effects Risky Behavior Outcomes - Ethnicity Subgroup Analysis*

Outcome	White			Mulattoes Pardos			Black Pretos		
	PSM	Probit/OLS	IPTW	PSM	Probit/OLS	IPTW	PSM	Probit/OLS	IPTW
Use of contraceptive methods	0.572*** (0.186)	0.046 (0.220)	0.517*** (0.172)	-0.064 (0.121)	0.161 (0.201)	0.098 (0.104)	0.060 (0.174)	0.220 (0.224)	0.045 (0.132)
Teen/Young Pregnancy	-0.013 (0.040)	0.106 (0.194)	-0.010 (0.045)	-0.009 (0.039)	-0.007 (0.131)	-0.003 (0.033)	0.029 (0.056)	0.014 (0.207)	0.017 (0.040)
Unplanned Pregnancy	0.029 (0.035)	0.033 (0.195)	0.029 (0.033)	-0.059** (0.040)	-0.199 (0.130)	-0.056 (0.037)	0.008 (0.058)	0.060 (0.203)	-0.013 (0.044)
Frequency smoking cigarettes	-0.198* (0.134)	-0.283** (0.132)	-0.215* (0.115)	-0.070 (0.107)	-0.278** (0.103)	-0.070 (0.086)	-0.010 (0.172)	-0.148 (0.147)	-0.048 (0.130)
Frequency drinking Alcohol	0.092 (0.202)	-0.019 (0.127)	0.043 (0.178)	0.132 (0.163)	0.149 (0.098)	0.134 (0.156)	0.307 (0.249)	0.101 (0.147)	0.271 (0.217)
Currently of Drugs	-0.008 (0.024)	-0.643** (0.320)	0.009 (0.012)	0.043 (0.045)	0.073 (0.102)	0.051 (0.034)	0.043 (0.045)	0.073 (0.102)	0.051 (0.034)
Used drugs after the age of 16	0.005 (0.029)	0.099 (0.209)	0.002 (0.028)	0.003 (0.026)	-0.103 (0.164)	-0.005 (0.018)	-0.037 (0.044)	-0.254 (0.220)	-0.049 (0.048)

Note \*Significant at 10%; \*\*significant at 5%; \*\*\* Significant at the 1% level. Each model is estimated using the same set of covariates. The samples of having a formal job and wages were restricted to those that reported being working during the month of the survey. Total working sample N=1370, Whites N=520, working N=321. Mulattoes/Pardos N=1005, working N=572, Pretos/black N=485 working N=316 Female subsample = 578. Working male subsample N= 750. All PSM standard errors were bootstrapped 1000 times.

Table H6

*Comparisons of Treatment Effects Risky Behavior Outcomes - Subgroup 16 to 17 and 18 to 20 years Analysis*

Outcome	Northeast Region			Southeast Region		
	PSM	PROBIT	IPTW	PSM	PROBIT	IPTW
Use of contraceptive methods	0.041 (0.154)	0.031 (0.255)	-0.061 (0.132)	0.375*** (0.150)	0.179 (0.194)	0.413*** (0.141)
Teen/Young Pregnancy	0.000 (0.046)	0.211 (0.194)	0.030 (0.042)	-0.004 (0.046)	-0.081 (0.139)	-0.010 (0.039)
Non Planned Pregnancy	0.002 (0.044)	0.020 (0.197)	0.008 (0.035)	-0.026 (0.046)	-0.109 (0.139)	-0.032 (0.041)
Frequency smoking cigarettes	-0.058 (0.131)	-0.213 (0.152)	-0.060 (0.101)	-0.464*** (0.131)	-0.257** (0.104)	-0.448*** (0.147)
Frequency drinking Alcohol	-0.054 (0.217)	0.115 (0.131)	-0.072 (0.196)	0.121 (0.174)	0.236** (0.102)	0.155 (0.196)
Currently of Drugs	-	-	-	-0.033* (0.021)	-0.324* (0.199)	-0.032 (0.029)
Used drugs after the age of 16	-0.007 (0.025)	-0.307 (0.287)	-0.008 (0.016)	-0.017 (0.029)	-0.054 (0.155)	-0.012 (0.035)

Note \*Significant at 10%; \*\*significant at 5%; \*\*\* Significant at the 1% level. All models estimated using the same set of covariates. All PSM standard errors were bootstrapped. Model 1 -2 for the Southeast regions N= 972, and use of contraceptives sample N= 660. Model 1 -2 for the Northeast regions N= 579, and use of contraceptives sample N= 366.

Table H7

*Comparisons of Treatment Effects - Schooling and Labor Outcomes – Effects by Cash Transfer Recipient*

Outcome	Transfer to Adolescents			Transfer to Parents		
	PSM	Probit/OLS	IPTW	PSM	Probit/OLS	IPTW
Completed Middle School	0.215*** (0.037)	0.455*** (0.073)	0.219*** (0.036)	0.005 (0.048)	0.044 (0.091)	-0.002 (0.041)
Completed High School	0.049* (0.042)	0.266** (0.116)	0.045 (0.039)	-0.083** (0.052)	-0.344* (0.146)	-0.085* (0.046)
Has College Aspirations	0.084*** (0.036)	0.098 (0.072)	0.087** (0.037)	-0.084** (0.052)	-0.345** (0.091)	-0.085* (0.046)
Only Studying	-0.036 (0.035)	-0.105 (0.080)	-0.014 (0.030)	-0.042 (0.045)	-0.029 (0.099)	-0.027 (0.038)
Study and Work	0.120*** (0.035)	0.192*** (0.037)	0.105*** (0.032)	0.156*** (0.048)	0.417*** (0.089)	0.137*** (0.040)
Only Working	-0.010 (0.045)	0.034 (0.033)	-0.024 (0.032)	-0.014 (0.042)	-0.235** (0.043)	-0.013 (0.033)
Not Working and Not Studying	-0.074*** (0.028)	-0.205** (0.093)	-0.066** (0.028)	-0.099*** (0.033)	-0.587*** (0.138)	-0.096*** (0.029)
Formal Job (Carteira Assinada)	-0.006 (0.051)	-0.087 (0.089)	-0.013 (0.052)	0.063 (0.068)	0.090 (0.110)	0.050 (0.060)

Note.\*Significant at 10%; \*\*significant at 5%; All models estimated using the same set of covariates. All models estimated using the same set of covariates. All results use bootstrapped standard errors. Young ages 16 or 17 were excluded from the sample since it would be normal that at that age they have not completed high school. Models 1-3 transfer to adolescents N= 1757, working sample N=1085. Participants whose parents received the subsidy directly were excluded. Models 1-3 transfer to Parents N= 898, working sample N=587.

Table H8

*Comparisons of Treatment Effects Risky Behavior Outcomes - Effects by Cash Transfer Recipient*

Outcome	Transfer to Adolescents			Transfer to Parents		
	PSM	PROBIT	IPTW	PSM	PROBIT	IPTW
Use of contraceptive methods	0.214** (0.096)	0.226* (0.085)	0.219** (0.094)	0.243** (0.123)	0.137 (0.166)	0.136 (0.113)
Early Pregnancy	0.031* (0.029)	0.063 (0.095)	0.035 (0.022)	-0.002 (0.032)	-0.004 (0.122)	-0.006 (0.029)
Unplanned Pregnancy	-0.031* (0.029)	-0.062 (0.094)	-0.026 (0.027)	-0.027 (0.032)	-0.097 (0.121)	-0.035 (0.029)
Frequency smoking cigarettes	-0.168** (0.081)	-0.202*** (0.071)	-0.178** (0.093)	-0.070 (0.097)	-0.294*** (0.092)	-0.076 (0.092)
Frequency drinking Alcohol	0.177* (0.120)	0.080 (0.068)	0.162 (0.113)	0.248** (0.160)	0.150 (0.084)	0.240* (0.141)
Currently of Drugs	-0.016* (0.015)	-0.357** (0.153)	-0.018 (0.014)	-0.005 (0.016)	-0.369* (0.208)	-0.005 (0.013)
Used drugs after the age of 16	-0.008 (0.020)	-0.048 (0.109)	-0.018 (0.019)	-0.017 (0.024)	-0.160 (0.146)	-0.013 (0.020)

Note.\*Significant at 10%; \*\*significant at 5%; All models estimated using the same set of covariates. All results use bootstrapped standard errors. Transfer to adolescents sample N= 1757. In this sample Participants whose parents received the subsidy directly were excluded. Use of contraceptive sample N=1189. This sample only includes adolescents that reported already have their first sexual relations. Models 1-3 for the transfer to Parents sample N= 898. Participants that received the subsidy directly were excluded from the sample. Models 1 -3 from using contraceptive methods only include adolescents that reported already had their first sexual relation N= 602.



Table H9

*Comparisons of Treatment Effects - Risky Behavior Outcomes – Effects by Cash Transfer Recipient Females subsample*

Outcome	Transfer to Adolescents Females			Transfer to Parents		
	PSM	PROBIT	IPTW	PSM	PROBIT	IPTW
Use of contraceptive methods	0.107* (0.156)	0.215 (0.165)	0.271* (0.154)	0.243** (0.123)	0.137 (0.166)	0.136 (0.113)
Early Pregnancy	0.020 (0.045)	0.058 (0.117)	0.026 (0.038)	-0.002 (0.032)	-0.004 (0.122)	-0.006 (0.029)
Unplanned Pregnancy	-0.054* (0.025)	-0.124 (0.115)	-0.051 (0.044)	-0.027 (0.032)	-0.097 (0.121)	-0.035 (0.029)
Frequency smoking cigarettes	-0.142* (0.113)	-0.205** (0.099)	-0.149 (0.106)	-0.070 (0.097)	-0.294*** (0.092)	-0.076 (0.092)
Frequency drinking Alcohol	0.201 (0.154)	0.178* (0.094)	0.181 (0.164)	0.248** (0.160)	0.150 (0.084)	0.240* (0.141)
Currently of Drugs	-0.012 (0.017)	-0.292 (0.304)	-0.012 (0.013)	-0.005 (0.016)	-0.369* (0.208)	-0.005 (0.013)
Used drugs after the age of 16	0.001 (0.025)	-0.004 (0.168)	0.002 (0.023)	-0.017 (0.024)	-0.160 (0.146)	-0.013 (0.020)

Note.\*Significant at 10%; \*\*significant at 5%; All outcomes are estimated using the same set of covariates. All results use bootstrapped standard errors. Transfer to adolescents sample N= 1757. In this sample Participants whose parents received the subsidy directly were excluded. Use of contraceptive sample N=1189. This sample only includes adolescents that reported already have their first sexual relations. Models 1-3 for the transfer to Parents sample N= 898. Participants that received the subsidy directly were excluded from the sample. Models 1 -3 from using contraceptive methods only include adolescents that reported already had their first sexual relation N= 602. Females =916, sexually active = 523

Table H10

*Method Comparison - Schooling and Labor Outcomes - Dosage Analysis Models 1 to 3 Within High, Medium and Low Dosage Treatment Groups*

Outcome	High Dosage			Medium Dosage			Low Dosage		
	PSM	Probit/OLS	IPTW	PSM	Probit/OLS	IPTW	PSM	Probit/OLS	IPTW
Completed Middle School	0.122*** (0.041)	0.381*** (0.082)	0.121*** (0.038)	0.115*** (0.044)	0.297*** (0.083)	0.115*** (0.041)	0.152*** (0.051)	0.382*** (0.096)	0.160*** (0.043)
Completed High School	0.106** (0.047)	0.290** (0.119)	0.113*** (0.039)	0.061 (0.068)	-0.015 (0.053)	0.007 (0.054)	0.013 (0.131)	0.007 (0.049)	0.015 (0.061)
Has College Aspirations	0.067** (0.041)	0.204** (0.082)	0.066* (0.038)	-0.013 (0.049)	-0.071 (0.119)	-0.015 (0.053)	0.028 (0.052)	-0.033 (0.092)	0.034 (0.047)
Only Studying	-0.051* (0.039)	-0.080 (0.089)	-0.041 (0.034)	-0.032 (0.042)	-0.068 (0.090)	-0.017 (0.038)	0.000 (0.048)	-0.086 (0.103)	0.002 (0.040)
Study and Work	0.101*** (0.041)	0.281*** (0.079)	0.089** (0.037)	0.094** (0.043)	0.224*** (0.080)	0.085** (0.038)	0.068* (0.048)	0.251*** (0.090)	0.064*** (0.044)
Only Working	-0.015** (0.040)	-0.058 (0.088)	-0.015 (0.033)	-0.008 (0.038)	-0.014 (0.089)	-0.006 (0.035)	-0.005 (0.044)	0.001 (0.102)	-0.008 (0.039)
Not Working and Not Studying	-0.035* (0.029)	-0.292*** (0.030)	-0.031 (0.024)	-0.070*** (0.032)	-0.292*** (0.059)	-0.063** (0.038)	-0.307** (0.134)	-0.058* (0.033)	-0.099*** (0.045)
Formal Job (Carteira Assinada)	-0.005 (0.061)	-0.043 (0.099)	-0.006 (0.052)	-0.022 (0.059)	-0.021 (0.059)	-0.020 (0.063)	-0.185 (0.114)	-0.018 (0.058)	-0.044 (0.072)

Note: \*\*Significant at 10%; \*significant at 5%; \*\*\* significant at 1%. All outcomes are estimated using the same set of covariates. All models estimated using the same set of covariates. All results use bootstrapped standard errors. Adolescents aged 16 and 17 were excluded from the outcome completed high school. High dosage N=1161 and Working N=716. Medium dosage N= 1122, working N=681. Low dosage sample N= 890, working N= 531.

Table H11

*Method Comparison - Dosage Analysis – Risky behaviors*

Outcome	High Dosage			Medium Dosage			Low Dosage		
	PSM	Probit/OLS	IPTW	PSM	Probit/OLS	IPTW	PSM	Probit/OLS	IPTW
Use of contraceptive methods	0.122 (0.104)	0.222 (0.148)	0.296*** (0.102)	0.183* (0.105)	0.137*** (0.146)	0.208** (0.107)	0.394*** (0.121)	0.214 (0.178)	0.361*** (0.111)
Early Pregnancy	0.016 (0.028)	0.079 (0.107)	0.025 (0.026)	0.032 (0.031)	0.078 (0.106)	0.029 (0.025)	-0.027 (0.036)	-0.090 (0.049)	-0.022 (0.034)
Unplanned Pregnancy	-0.030 (0.033)	-0.076 (0.106)	-0.025 (0.027)	-0.010 (0.032)	-0.051 (0.106)	-0.011 (0.026)	-0.061** (0.035)	-0.101 (0.123)	-0.054 (0.036)
Frequency smoking cigarettes	-0.203*** (0.089)	-0.375*** (0.082)	-0.215** (0.087)	-0.124* (0.092)	-0.208** (0.081)	-0.131 (0.092)	-0.058 (0.107)	-0.011 (0.090)	-0.057 (0.097)
Frequency drinking Alcohol	0.171* (0.130)	0.028 (0.077)	0.144 (0.123)	0.066 (0.142)	0.114 (0.078)	0.049 (0.138)	0.425*** (0.164)	0.185** (0.090)	0.409*** (0.148)
Currently of Drugs	-0.014 (0.015)	-0.404** (0.181)	-0.014 (0.014)	-0.019* (0.017)	-0.445** (0.190)	-0.019 (0.014)	-0.020 (0.019)	-0.193 (0.196)	-0.021 (0.020)
Used drugs after the age of 16	-0.017 (0.021)	-0.083 (0.125)	-0.019 (0.023)	-0.022 (0.024)	-0.101 (0.127)	-0.021 (0.023)	-0.013 (0.026)	-0.015 (0.139)	-0.014 (0.025)

Note: \*\*Significant at 10%; \*significant at 5%; \*\*\* significant at 1%. All outcomes are estimated using the same set of covariates. All models estimated using the same set of covariates. All results use bootstrapped standard errors. Adolescents aged 16 and 17 were excluded from the outcome completed high school. High dosage N=1161 and Working N=716. Medium dosage N= 1122, working N=681. Low dosage sample N= 890, working N= 531.