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FELIPE RESENDE OLIVEIRA

ESSAYS ON SOCIOEMOTIONAL SKILLS AND LEARNING

RECIFE
2018

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ESSAYS ON SOCIOEMOTIONAL SKILLS AND LEARNING

Tese apresentada ao Programa de Pós-Graduação (PIMES) do Departamento de Economia da Universidade Federal de Pernambuco como requisito parcial para obtenção do título de Doutor em Ciências Econômicas

Orientadora**:** Prof.ª Dra. Tatiane Almeida de Menezes

Coorientador: Prof. Dr. Guilherme Diniz Irffi

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RESUMO

Esta tese é composta por dois artigos em Microeconomia Aplicada - Economia da Educação.O primeiro capítulo busca medir o efeito do bullying em matemática dos alunos do 6º ano do ensino público da cidade do Recife, Pernambuco, Brasil, com o uso de dados de uma pesquisa da Fundação Joaquim Nabuco em 2013. A metodologia aplicada é Propensity Score Matching (PSM), a fim de comparar os alunos que relataram ter sofrido bullying com um grupo de controle, constituído por alunos que não sofreram bullying. Especificamente, pretendo entender o papel das habilidades emocionais sociais e sua potencial influência no bullying. Os resultados sugerem que o bullying tem um impacto negativo no desempenho em matemática e que as habilidades emocionais sociais podem ajudar os alunos a lidar com o bullying. Diversas técnicas econométricas foram usadas para contornar problemas de endogeneidade. Para identificar traços de personalidade, usamos um modelo de analise fatorial que também serve para corrigir o viés de erro de previsão. A análise de sensibilidade indicou problemas potenciais de variáveis omitidas. Os resultados indicam que os programas anti-bullying devem levar em conta as habilidades emocionais sociais.No segundo capítulo, discuto que existem pesquisas escassas, mas relevantes, que afirmam a importância de educar as competências socioemocionais para os jovens, pois isso impacta o sucesso do indivíduo na vida, e o que é ainda mais escasso é a análise dos resultados e impacto dos programas que funcionam em direção a esse objetivo educacional, seja implementado através de políticas públicas e projetos financiados pelo governo. Este capítulo procura avaliar o impacto do Projeto Academia Educar em 2016, enfocando seu desenvolvimento em habilidades socioemocionais nos alunos, através dos métodos Propensity Score Matching e Diferenças em Diferenças. Efeitos positivos e significativos foram encontrados em Sociabilidade (12% do valor inicial), Assertividade (16% do valor inicial) e Participação Política (dobrou a porcentagem inicial de tratados interessados em participar da política do país). Os resultados para as variáveis Locus de Controle e Imaginativo foram significativos e na direção esperada apenas em parte das especificações; para Volatilidade, os resultados não sugerem impacto. Várias análises de robustez foram realizadas para validar os resultados encontrados.

Palavras-chave: Bullying. Avaliação de impacto. Matemática. Habilidades socioemocionais. Propensity score matching. Diferenças nas diferenças.

ABSTRACT

This thesis is composed by two articles in Applied Microeconomics - Economics of Education.The first chapter seeks to measure the effect of bullying in math scores of students in the 6th grade of public school in the city of Recife, Pernambuco, Brazil with the use of data from a survey by Joaquim Nabuco Foundation in 2013. The methodology applied is Propensity Score Matching (PSM) in order to compare students who reported having suffered bullying with a control group, consisting of students who did not suffer bullying. Specifically, I aim to understand the role of social emotional skills and their potential influence on bullying. The results suggest that bullying has a negative impact on performance in mathematics and that social emotional skills can help students deal with bullying. Several econometric techniques were used to circumvent endogeneity problems. To identify personality traits, we use a factor model that also serves to correct for prediction error bias. The sensitivity analysis indicated potential problems of omitted variables. The results indicate that anti-bullying programs should take into account social emotional skills.In the second chapter, I discuss that there are scarce but relevant researches stating the importance of educating socioemotional competencies to the youth as it impacts individual's success in life, and what is even more scarce is the analysis of the results and impact of programs that work towards that educational goal, either implemented though public policies and Government funded projects. This chapter seeks to evaluate the impact of the Academia Educar Project in 2016, focusing on its' development of socioemotional skills on students using the methods of Propensity Score Matching and Differences in Differences. Positive and significant effects were found on Sociability (12% of initial value), Assertiveness (16% of initial value) and Political Participation (double the initial percentage of treaties interested in participating in the country's policy). The results for Locus Control and Imaginative variables were significant and in the direction expected only in part of the specifications; for Volatility, the results do not suggest impact. Several robustness analyzes were performed to validate the results found.

Keywords: Bullying. Impact evaluation. Mathematics. Socioemotional skills. Propensity score matching. Differences in differences.

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SUMMARY

1 INTRODUCTION

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The first chapter seeks to measure the effect of bullying in math scores of students in the 6th grade of public school in the city of Recife, Pernambuco, Brazil with the use of data from a survey by Joaquim Nabuco Foundation in 2013. The methodology applied is Propensity Score Matching (PSM) in order to compare students who reported having suffered bullying with a control group, consisting of students who did not suffer bullying. Specifically, we aim to understand the role of social emotional skills and their potential influence on bullying. The results suggest that bullying has a negative impact on performance in mathematics and that social emotional skills can help students deal with bullying. Several econometric techniques were used to circumvent endogeneity problems. To identify personality traits, we use a factor model that also serves to correct for prediction error bias. The sensitivity analysis indicated potential problems of omitted variables. The results indicate that anti-bullying programs should take into account social emotional skills.

In the second chapter, I discuss that there are scarce but relevant researches stating the importance of educating socioemotional competencies to the youth as it impacts individual's success in life, and what is even more scarce is the analysis of the results and impact of programs that work towards that educational goal, either implemented though public policies and Government funded projects. This chapter seeks to evaluate the impact of the Academia Educar Project in 2016, focusing on its' development of socioemotional skills on students using the methods of Propensity Score Matching and Differences in Differences. Positive and significant effects were found on Sociability (12% of initial value), Assertiveness (16% of initial value) and Political Participation (double the initial percentage of treaties interested in participating in the country's policy). The results for Locus Control and Imaginative variables were significant and in the direction expected only in part of the specifications; for Volatility, the results do not suggest impact. Several robustness analyzes were performed to validate the results found.

2 BULLYING EFFECT ON STUDENT'S PERFORMANCE

1.1 Introduction

Bullying is a behavioral phenomenon that has attracted the attention of educators and policy makersin many parts of the world in recent years. For Fante (2005), bullying is a situation which is characterized by intentional verbal or physical abuse, made repetitively, by one or more students against one or more peers. The author states that this phenomenon is a form of violence quickly growing in the world. In Brazil, during November 2015 the Federal government established the nationwide initiative called the Systematic Program[1] to Combat Bullying[2]. Thisfederal law aimsto combat bullying throughout society, especially in schools.

Levitt and Dubner (2014) state that trillions of dollars were spent on educational reform projects around the world, usually focusing on some sort of overhaul of the system: better curriculum, smaller classes, more testing and so on. For the authors, the main raw material of the educational system – the students themselves – is often overlooked. For Kibriya et al. (2015) bullying is an important issue that could affect performance in school, which is often overlooked.

There is a consensus among economists that higher levels of education increase economic growth, the income of individuals and the quality of life (BARRO, 1991; HANUSHEK; KIMKO, 2000; DOPPELHOFER; MILLER, 2004). For Glewwe et al. (2016) a greater number ofschool enrollment may have little influence on economic growth and personal income if children do not learn effectively while they are in school. Bullying can affect the child's learning and trigger effects on further income throughout life, since the child's school life is compromised.

According to the data resulting from research conducted by Joaquim Nabuco Foundation in 2013 with 4191 students in 6th grade (grade 5) of the public schools of Recife it was shown that 36.41% of students said they fully agree with the fact that they suffered bullying and 40.71% when the question was stated with a "maybe". A study by Nansel et al. (2001) with a sample of 15,686 American students of the 6th year (the 1st year of middle school) showed that about 30% of students reported moderate or frequent involvement in bullying.

[1] Anti-bullying laws and campaigns have also been implemented in the US, Canada, UK, Germany, Scandinavian countries, Colombia and South Korea

[2] For details, see Law No. 13,185, of November 6, 2015.

Mullis et al. (2012) suggest in a survey from2011 withmore than 300,000 studentsfrom48 developed and developing countries, that more than 50% of the students reported that they experienced bullying in school and 33% of the sample reported having been bullied weekly. Note that bullying is a problem present in several countries, be they rich or poor countries (BROWN;TAYLOR, 2008; AMMERMUELLER, 2012; ERIKSEN ET AL., 2012; DUNNE ET AL., 2013; PONZO, 2013).

In this context, the objective of the current study is to investigate whether bullying has an effect on the grades of students in mathematics. Specifically, we seek to understand potential factors that may influence the effect of bullying among students as well as we seek to investigate the effect of social emotional skills and their ability to reduce the negative effect of bullying in school.

For this, data from a survey of 2013 conducted by the Joaquim Nabuco Foundation was used with students of the 6th year of different public schools in Recife. We used a quasi-experimental setting consisting of both OLS estimation and Propensity Score Matching (PSM). This approach reduces the selection bias to find a more similar control group to the treatment group, based on observable characteristics and then compares the effect of bullying on the mathematics performance of students who have experienced bullying (treated) with students who have not experienced bullying (control). Several robustness analyses were performed to ensure the validity of the results.

Further on, after this introduction, the publications proceed as follows. The next section presents a brief review of the literature. Section 3 presents the description of the database and some descriptive statistics. Section 4 presents the empirical strategy used in the estimation models. Section 5 presents the results and interpretations. The robustness and sensitivity analyses are presented and discussed in Section 6. Finally, the last section presents the final considerations.

1.2 Literature review

The literature is quite rich when investigationsinvolve the effects ofschool, families, teacher characteristics, parental schooling, student gender, cognitive ability in various social dimensions such as Hanushek (1986), Farkas et al. (1990), Card and Krueger (1992), Farkas et al. (1997), Murnane et al. (2000), Kerckhoff et al. (2001), Riani and Rios-Neto (2008). On the other hand, the amount of work that has addressed the effect of bullying on academic performance is limited (PONZO, 2013).

Besides that, bullying is a widespread problem, it is also very costly, especially because not only sufferers but also those who cause bullying suffer negative consequences throughout life, Sarzosa and Urzúa (2015). By repeating this behavior several times, the oppressor can express emotional frailty and high level of psychic suffering. According to some data that was produced by a website managed by the U.S. Department of Health and Human Services called stopbullying.gov, 160,000 children miss school every day in the US due to fear of being bullied (this represents 15% of all students missing classes); Bullying sufferers are between 2 to 9 times more likely to consider suicide than nonbullying sufferers; In the UK at least 50% of the suicides among young people are related to these experiences and of every ten students, one leaves school or move to another one due to the stress and traumas that are commonly related to bullying.

Researchers as Bowles and Herbert (1976) have discussed the importance of non-cognitive skills as good indicators of success in life. They argued that non-cognitive skills can be considered even more important than cognitive abilities to determine various factors throughout people's lives. In the same sense, Almlund et al. (2011) also consider traits of more malleable personalities more important throughout the life cycle than cognitive factors, which becomes highly stable at around 10 years. The study suggests that interventions that are capable of changing personality traits are promising ways for combating poverty and social disadvantages. Gensowski (2014) points out that lifetime earnings are substantially influenced by education and personality traits[3].

In a British study of the National Institute of Child Development, Brown and Taylor (2008) investigated the effect of school bullying. The results suggest an adverse effect on the accumulation of human capital. The impact of bullying on 16-year-old school teenagers is equivalent to the effects of class size. The effect of class size disappears for young people at more advanced ages, however, the effect of bullying remains during adult life, directly influencing the salaries received during the life cycle and indirectly through the levels of schooling reached. Harmon and Walker (2000) argued that levels of schooling at higher ages are not affected by class size, but contact with bullying has an impact on educational level throughout life

[3] As Gensowski (2014), personality traits are constructed from the Big Five taxonomy for this study. The items dedicated to each personality factor are constructed with factorial analysis. For a discussion of the Big Five model, see Mccrae and John (1992), Almlund et al. (2011) and the articles they cite. To access an online version of the Big Five instrument, visit the instrument is free.

The study by Kibriya et al. (2015) analyzed school bullying in Ghana from a survey of 7323 8th grade students in 2011. The results show a negative impact of bullying on math scores and the magnitude of the effect found was greater among girls. The effect of bullying decreases in the case of students who have a female teacher. The authors used Propensity Score Matching and a series of robustness to validate their results. For them, bullying policies must take into account the gender of students.

Sarzosa and Urzúa (2015) used a structural model through a longitudinal research with young people to estimate the effects of bullying based on the identification of latent abilities. The authors find that non-cognitive[4], as opposed to cognitive, abilities significantly reduce the chances of bullying, or cyberbullying during high school. The structural model allowed us to estimate the mean effect of treatment (ATE) with children who practice bullying and are bullied at age 15 and various outcomes measured at age 18. The effect is damaging for both groups and the damage differences occur because of how cognitive and non-cognitive abilities attenuate or aggravate the consequences. For them, the development of non-cognitive skills is fundamental in any policy to combat bullying.

Heckman et al. (2006) used data from a representative sample of young Americans aged 14–21 from the National Longitudinal Survey of Youth in 1979 to determine that non-cognitive skills are at least as important as cognitive abilities[5] when explaining some social performances throughout life. For example, non-cognitive skills appear to have a strong influence on decision-making about school choices, work choices, and profession. In addition, such skills are important in explaining the chance of someone engaging in risky behavior.

For Brown (2004) the period of adolescence is very vulnerable to social pressure and young people seek to be part of a group and desire popularity. According to Bursztyn and Jensen (2015) adolescents may be more likely to give in to such pressure and engage in behaviors that may have long-term effects. The authors analyzed a computer learning program, used in more than 100 predominantly American schools through natural and field experiments. For the authors, when the effort is observable to their peers, students can avoid social sanctions according to the norms in force. At the first moment of the experiment, the individual results were secret, but after a period the

[4] Non-cognitive abilities are defined as personality and motivational traitsthat guide the way one feels, behaves and formulatesthoughts, Borghans et al. (2008).
[5] Skills normally measured by standardized tests, such as IQ tests and performance tests.

program started to generate public rankings and this led to the introduction of the ranking leading to a decline of 24% in performance. Classes with "honor classes" have an inverse effect, that is, when the rule is to have good grades, being in the ranking increases the popularity, encouraging the effort, since when the norm is to be a normal student and to have average grades the efforts are not to stand out.

Most of the studies claim that bullying leads to poor academic performance[6] and lower incomes after school completion (LE et al., 2005; KOSCIW et al., 2013; PONZO, 2013; KIBRIYA et al., 2015). According to Boulton and Underwood (1992) some aspects that may explain these results of worst outcomes in terms of academic success are the following: bullying victims have a higher tendency to report unhappiness and loneliness at school, as well as reporting having fewer close friends. In addition, another study done by Kumpulainen et al. (2001), Fekkes et al. (2006) showed that victims of bullying are more likely to develop new psychosomatic and psychosocial problems compared to children who were not bullied, therefore difficult time to deal with loneliness, anxiety and depression, which can be related to academic performance with the expected struggles students might have when facing such challenges.

The theme is very relevant for national and international literature. Quantitative evidence of this problem in the context of developing countries has been scarce and the causal direction remains unclear. Our study aims to fill this gap in the literature. We use a rich dataset from Joaquim Nabuco Foundation that allows us to identify the children who suffered bullying and be the first study that estimate the causal impact of bullying in Brazil. In this case, a randomized control trial would be ideal for the investigation, however it would be unethical to have a child being put in thissituation. Therefore, it is challenging to draw causal inferences about the relationship between bullying and school performance.

Besides concerns regarding the over selection and endogeneity bias, students' performance might also get affected by peer effect environment both inside and outside school. According to Kibriya et al. (2015) it is possible that a student has a lower academic performance because of being a victim of bullying, or the likelihood of a student being bullied is higher due to worst academic performance itself. Ponzo (2013) attempted to solve the reverse causality problem by employing a non-parametric method, in the case, the author used Propensity Score Matching. Using only a linear

[6] An exception is Woods and Wolke (2004).

regression analysis may underestimate or overestimate the effect of bullying. Hence, we decided to employ the Propensity Score Matching to reduce selection bias and estimate the average effect of bullying that will be described in detail in the next sections.

1.3 Data

The main source of information in this study is the result of the research Longitudinal Follow-up on the Student Performance of the Public-School Network of Recife, carried out in 2013 by the Joaquim Nabuco Foundation, among students of the 6th grade of public schools in the city of Recife.

The research consisted of a stratified sample[7] of the school enrollment in the 6th grade of public schools (municipal and state) of Recife's elementary school and their respective mathematics scores in Prova Brasil[8]. After applying these selection criteria, the target population of the research comprised of 28,983 6th grade students who were enrolled in 148 public schools located in the six Political-Administrative Regions (RPAs) of the city of Recife. The determination of the sample strata was based on iterative algorithms proposed by Lavalleé and Hidiroglou (1988), in which the boundaries of strata are estimated to minimize the variance of the estimator used in a stratified sampling

From this procedure, a total of 17 strata were generated through the combination of grades and school's enrollment. The sampling plan required that students were selected with probability proportional to the enrollment strata and mathematical grade, by RPAs, as it appears in the target population. Therefore, a random sample of students was selected and 118 schools were then drawn for participation in research[9].

In total, of 26 schools with 6th grade students were drawn of two classes each due to the high number of registrations, making the total number of classes selected for the study composition 146 classes. Data was collected from March to November 2013 from

[7] Of all the schools evaluated in the research, those with lessthan ten participantsin the series evaluated were excluded, as well asruralschools and those destined to the exclusive care of students from indigenous communities were not considered. Also eliminated were schools with unavailable information or that presented values equal to zero for the school supplies needed to construct the sample strata.

[8] The 2006 School Census (Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira (INEP)/Ministry of Education (MEC), 2006), together with the Mathematics notes of Prova Brasil (2005), constituted the database for the construction of information about the Recife public schools of elementary education evaluated in this study.

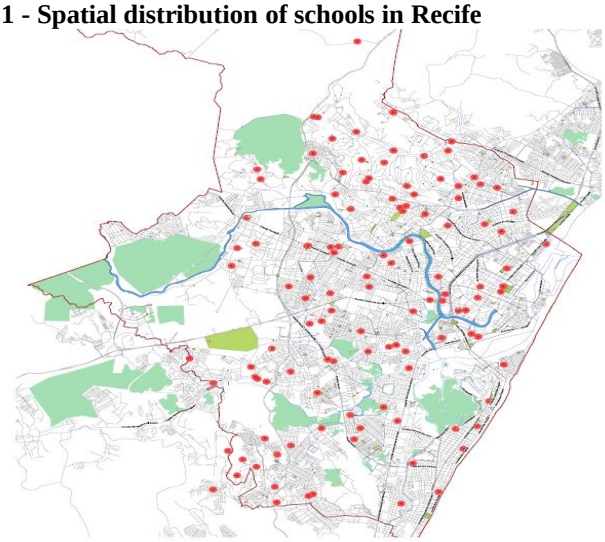
[9] In addition, two schools integrated the sample with probability equal to 1, totaling a total of 120 schools surveyed. These two schools were selected as control, since they present distinct characteristics of most public establishments education.

4191 students, 3670 parents or guardians, 120 directors and 131 teachers of 120 schools spatially distributed among 6 (RPAs) in Recife.

The research aims at evaluating the students' proficiency in mathematics (based on the criterion of Item Response Theory[10]) and to collect information regarding the internal and external aspects of the school. The information collected comes from questionnaires undertook by the students and their parents or legal guardians, the school director and the math teacher of the class in which the student is. All schools and all classes belonging to those were selected randomly. The questionnaire for the students has an affirmation that seeks to understand the degree of agreement / disagreement with the bullying suffered by the student.

The questionnaire that students had to do was made of 96 items. Although the questionnaire does not aim at constructing non-cognitive skills, it is possible to establish through a factorial analysissome traits ofstudents' personalities, such as conscientiousness, extraversion and emotional stability. In addition, the questionnaires address information such as; anthropometric measures,student behavior,school practices,school resources, work environment information, and other information. Fig. 1 shows the spatial distribution of the schools selected by Fundaj.

Figure 1.1 - Spatial distribution of schools in Recife



Source: Fundaj. Elaboration: Fundaj.

In addition to bullying, five other groups of factors captured by research can affect math performance. The first of them refers to the individual characteristics of the

[10] This criterion allows the comparability of the results between the applications made in different periods with different tests. This methodology is used in the main evaluations, such as Prova Brasil and National High School Examination (ENEM).

students, such as gender, age, race, body mass index and noncognitive abilities. The second factor refers to the characteristics of the family, which are the level of education of the person in charge, per capita income, and the presence of those responsible in the student'sschool life. The third factor is the characteristics of the teacher, such as gender and age. The fourth factor is that the student participates in the family scholarship program if he/she has already been denied one or more times. The last factor that affects performance in mathematics refers to the characteristics of the school.

Table 1.1 presents the descriptive statistics in the 6th grade students of public schools in Recife. The average age of the students is approximately 11 years. Girls performed better than boys on the math test and this difference had a 5% significance. The likelihood of bullying between boys and girls is similar. Other variables of interest are presented in the same Table 1.1.

Table 1.1- Descriptive statistics of the characteristics of students, teachers, schools

	Observations	Mean	Standard deviation	Minimum	Maximum
Score	3.688	41.83	16.53	0	100
Male	1.865	41.27	16.67	0	95
Female	1.823	42.41	16.36	0	100
Bullied 1	1.330	0.37	0.48	0	1
Male	664	0.37	0.48	0	1
Female	666	0.37	0.48	0	1
Bullied 2	1.487	0.40	0.49	0	1
Male	765	0.41	0.49	0	1
Female	722	0.39	0.48	0	1
Male student	1.865	0.50	0.50	0	1
White	669	0.18	0.39	0	1
Black	456	0.12	0.32	0	1
Age	3.688	11.40	1.07	9	23
Underweight	1.933	0.52	0.49	0	1
Normal weight	1.423	0.38	0.48	0	1
Overweight	264	0.07	0.26	0	1
Presence of the person in charge	3.216	0.00	1.00	-1.05	5.01
Bachelor / Undergraduate	55	0.01	0.12	0	1
High school	1.073	0.33	0.47	0	1
Elementary school	1.767	0.54	0.49	0	1
Female Teacher	2.534	0.68	0.46	0	1
Teacher age	108	0.02	0.16	0	1
Disapproved 1 time	763	0.20	0.40	0	1
Disapproved 2 times	311	0.08	0.27	0	1
Program transfer	1.857	0.57	0.49	0	1
Class 1	62	0.01	0.12	0	1
Class 2	501	0.13	0.34	0	1
Class 3	1.845	0.50	0.50	0	1
Low drop out	3.163	0.85	0.34	0	1
Average drop out	457	0.12	0.32	0	1
High drop out	68	0.01	0.13	0	1

Source: Own elaboration based on data from Fundaj 2013.

Score refers to a math test with 20 items applied in March. Bullied 1 refers to all students who have fully agreed to have already suffered bullying, and Bullied 2 is when we group students who said "maybe" into bullying. The weight measures found in the table are derived from the body mass index[11] (BMI), where Underweight are students who have a BMI of less than 18.5, Normal weight students with BMI greater than or equal to 18.5 and lower than 25 and overweight are students with BMI greater than or equal to 25 and less than 30. The variable presence of the responsible was constructed with factorial analysis from 4 items of the questionnaire of the responsible[12].

The variable Teacher age are teachers aged up to 24 years. The model specifications use other age categories. The Class variables refers to the number of students in the

[11] It is an international measure used to calculate whether a person is at ideal weight.
[12] Parent questionnaire items can be found in the Appendix in Supplementary material.

classroom, where Class 1 are rooms with up to 20 students, Class 2 has more than 20 students and less than 30 and Class 3 are rooms with more than 30 students and less than 40. Finally, dropout means the average percentage of abandonment of the 6th grade of elementary school. In the case, low dropout are students in the schools with a percentage below 10%, average dropout are students in the schools with a value of 11%–25% and high dropout are students in the schools with a percentage greater than 26% and less than 50%.

1.3.1 Construction of non-cognitive skills

To construct the empirical strategy, the estimation of the distribution parameters of non-cognitive latent variables uses scores that measure the socio-emotional competences. The questionnaires applied by Fundaj use a variety of measures related to socio-emotional skills. From the questionnaire[13], it was possible to establish indicators related to conscientiousness, extraversion[14] and emotional stability to be used in our estimations

The student who has conscientiousness demonstrates self-discipline, motivation, organization and is focused on performing duties and achieving the defined objectives. Their behavior follows a plan of action, which lowers their level of spontaneity. Extroversion is defined as the orientation of interests and energy toward the external world, people and things. The extroverted student is characterized by his or her ability to communicate, assertiveness, sociability and the tendency to draw attention to him- or herself within a group. Neuroticism refersto the emotional instability/stability of an individual, considering negative emotions such as anxiety, helplessness, irritability and pessimism.

Many have suggested a potential way of measuring personality traits of individuals. One way is presented by Mischel et al. (1989) through the "Marshmallow Test[15]"

[13] It was not possible to construct the personality traits openness to new experiencesand and amiability, taxonomy of the Big Five model, since these measures were not present in the questionnaire

[14] One of the items answered by the evaluator at the time of the questionnaire is whether the student is physically attractive. This item is used to build the Extroversion. For Lukaszewski and Roney (2011) the origins of variation of extroversion are miscreant. The authors state from two studies that attraction and physical strength account for a large portion of extroversion and this plot is independent of the variance explained by a polymorphism of the androgen receptor gene. These arguments support the use of this item for the construction of this personality trait.

[15] The test consists of offering a small reward (marshmallow, or some other candy) for 4-year-old children immediately or two small rewards if the child waits until the researcher returns (approximately 15 min).

experiment to measure these traits. The results show that children with higher capacities to postpone the reward are on average more intelligent, more likely to have a greater social responsibility and that the postponement time is significantly related to the SAT[16]. These results suggest that children who have an ability to postpone the larger reward are better able to cope with more personal and social problems. These are problems that are not completely attributable to school. According to Michell et al., the presence of the father is fundamental in the first years of the child's life for such behavior, since his presence stimulates the development of the child's executive functions during the first 4 years of life, even subtly the child learns to inhibit and not grant his or her desires.

Therefore, it isindispensable to use variablesthat expressstudents' non-cognitive abilities,since thisset of variables allows better specifications for model construction. Most of the social emotional measures found in the questionnaires are recorded in categoriesthat group studentreactions,such as "fully agree or disagree strongly"[17]. According to Sarzosa and Urzúa (2015) it is common practice in the literature to construct socio-emotional measures by adding categorical answers to several questions on the same topic, since this method incorporates a certain degree of continuity in the scores, something essential for the estimation process. The items used in the questionnaire to construct such measures can be found in Appendix A in Supplementary material. Table 1.2 shows the descriptive statistics of these skills.

Table 1.2- Descriptive statistics of students non-cognitive abilities

	Conscientiousness		Extroversion		Emotional stability	
	Mean	Stan. Desv.	Mean	Stan. Desv.	Mean	Stan. Desv.
All	-0.000	1.00	.000	1.00	0.000	1.00
Boys	0.165	1.09	0.025	1.018	0.038	0.994
Girls	-0.157	0.89	-0.023	0.981	-0.036	1.004

Source: Own elaboration based on data from Fundaj 2013.

According to the items identified by the questionnaire for the construction of socio-emotional measures, the lower the value of the score, the greater is their conscientiousness. The lower the score, the more extroverted the student will be in relation to the score related to emotional stability, the lower the student's more unstable

[16] SAT (Scholastic Assessment Test) is a standardized test widely used for admission to colleges in the United States.

[17] The questionnaire applied to the students to build the socio-emotional abilities has several items with categorical answers.

value in relation to emotional stability. These results are also found by Santos and Primi (2014).

The measure of cronbach's alpha has the objective of evaluating the magnitude in which the items of an instrument are correlated. The internal consistency of Cronbach's alpha is greater the closer to 1 is the value of the statistic[18]. In our study, cronbach's alpha for Conscientiousness is 0.49, Neuroticism 0.43, Extraversion 0.52 and Presence of the Responsible 0.41. For Landis and Koch (1977) the results found are considered moderate. In this way, the items that make up measure the same instrument created.

Santos and Primi (2014) investigated the socio-emotional skills of students from Rio de Janeiro and Soto et al. (2011) also sought to understand the profiles of students in various places around the world and the results were quite similar. Both studiesfound that girlstend to be more conscientious, outgoing, and loving, despite having less emotional stability. According to Kyllonen et al. (2014) these characteristics are components of the five major factors that are identified as relevant to measure the traits and personality in the educational context.

1.4 Empirical strategy

We estimate the following model for student math score using ordinary least squares (OLS):

$$Y_i = \beta_0 + \beta_1 bullied_i + \beta_2 X_i + \varepsilon_i$$

where Y_i stands for the math student grade i, $bullied_i$ is a binary variable that assumes the value 1 if the student claims to have suffered bullying and 0, otherwise, X_i is the vector of control variables, which refer the characteristics of students, teachers, principals and schools, as described in Table 1, and the term ε_i is related to idiosyncratic error. Our interest lies in estimating β_1, as this parameter represents the impact of bullying on the math score, that is, the expected average difference in academic performance among students who are victims and not victims of bullying.

However, the estimate made by the OLS can be skewed due to problems of endogeneity. This bias arises as a result of an inadequate group of comparison. For this

[18] For Landis and Koch (1977) values greater than 0.80 have an almost perfect internal consistency, values from 0.61 to 0.80 are considered substantial, values from 0.41 to 0.60 is moderate, from 0.21 to 0.40 is reasonable and less than 0.21 is considered small.

analysis, students who do not suffer bullying may have different characteristics from those present in students who suffer from bullying due to the heterogeneity that may be present in the observations. Therefore, it is necessary to find a way to make these groups comparable. To overcome the problem of selection bias, a control group should be found (students who have not been bullied) to allow comparison with the treatment group (students who have already suffered from bullying). In this case, the propensity score method[19] is used to construct a control group similar to the treatment group in terms of certain observable characteristics.

The Propensity Score Matching (PSM) method seeks to find for each member of the treated group a more similar control group based on observable characteristics, which representsthe result that it would have obtained had it not been treated. For this, the method uses the conditional probability of treatment through a vector of observable characteristics (ROSENBAUM; RUBIN, 1983).

The objective of this method is to estimate the mean effect of treatment on treated subjects. For this to be possible, the hypotheses of conditional independence assumption (CIA[20]) and common support [21] need to be met. The implementation of the face estimator can be more complex when the size of the vector X, is large. One way around this problem is to use a function of X, which summarizes all the information contained in this vector. This function represents the propensity score[22] and means the probability in this case of suffering bullying, given the set of characteristics X and has the advantage of reducing the problem of dimensionality (ANGRIST; PISCHKE, 2009, CALIENDO; KOPEING, 2008, KHANDKER ET AL, 2010).

To estimate the effect of bullying on the math student score, we used several estimation methods with different criteria presented in the literature. We used the propensity score method with several matching algorithms criteria: nearest-neighbor, radius and kernel as described by Becker and Ichino (2002). The reweighting method[23] is also used in our estimates. This estimator is based only on the estimation of the propensity score, therefore, a great deal of attention must be paid to the specification of

[19] The empirical and theoretical literature on this method is quite extensive. For further details, Rosenbaum (2002), Rosebaum and Rubin (1983), Rubin (1973, 1977, 1979), Heckman et al. (1997), Abadie and Imbens (2002), Lalonde (1986) and Dehejia and Wahba (1999).

[20] $\left(Y_i(1), Y_i(0)\right) \perp T_i | X_i$ Also called selection in observables.

[21] $0 < Pr[T_i = 1 | X_i] < 1$. This hypothesis ensures that for each treated individual there is another individual not treated with similar values of X_i.

[22] Formally, we have $Y_i(0) \perp \mathrm{T}_i | X_i \Rightarrow Y_i(0) \perp \mathrm{T}_i | \mathrm{p}(X_i)$

[23] For a review of the reweighting method, see Imbens (2004) and Imbens and Wooldridge (2009).

the model chosen to determine the propensity score, Menezes-Filho et al. (2012). The method weights each unit in the control group because of the probability of not receiving the treatment, that is, the greater the probability that the student in the control group did not suffer from bullying, the lower their weight when we balance the control group. However, Firpo and Pinto (2012) do not recommend the use of traditional implementations, such as imputation or reweighting (IPW), since they do not allow immediate conclusions to the asymptotic properties requirement. Moreover, when the value of the propensity score is close to one, this estimator can assume very high values, due to its sensitivity to specification of the propensity score, Menezes-Filho et al. (2012).

Thus, the results reported in this paper refer to the estimator that combines the regression method with the reweighting method, since its estimator has the property of being double robust[24], since the weighting of the independent variables avoids potential sources of variable bias omitted, regardless of the parametric model adopted, introducing an additional robustness both by eliminating the correlation between the omitted covariates and by reducing the correlation between the omitted and included variables (WOOLDRIDGE, 2007; IMBENS; WOOLDRIDGE, 2009; FIRPO; PINTO, 2012).

If the parametric model for the propensity score is correctly specified or if the parametric model for the regression is correctly specified, the estimator is consistent to estimate the mean treatment effect on the treated (ATT[25]) (ROBINS; RITOV, 1997). To compare and demonstrate the robustness of the results, the coefficients of both estimators are presented in the next section.

1.5 Empirical results

Although the results for the OLS estimators are reported, the emphasis is on the PSM, reweighting and double robust estimator methods. The different reported estimators present the robustness of the results, allowing the comparability between the estimates. Table 1.3 presents the results of bullying using Ordinary Least Squares.

[24] According to Bang and Robin (2005) this method produces more consistent estimates when at least one of the estimation stages is correctly specified.
[25] Average Treatment Effect for the Treated

Table 1.3- Effect of bullying on math performance, estimated by OLS

	(1)	(2)	(3)	(4)	(5)
Bullying	-0.056***	-0.048***	-0.051***	-0.043**	-0.044**
	(0.017)	(0.017)	(0.017)	(0.016)	(0.017)
Age		-0.066***	-0.044**	-0.035**	-0.030*
		(0.012)	(0.017)	(0.017)	(0.017)
Conscientiousness		-0.042***	-0.040***	-0.037***	-0.034***
		(0.009)	(0.010)	(0.010)	(0.009)
Extroversion		-0.008	-0.003	-0.008	-0.007
		(0.008)	(0.008)	(0.010)	(0.008)
Emotional stability		0.025***	0.022**	0.019**	0.020**
		(0.008)	(0.008)	(0.008)	(0.008)
Disap. 2 times or more			-0.078	-0.080	-0.086
			(0.049)	(0.050)	(0.046)
Disap. 1 time			-0.088***	-0.096***	-0.103***
			(0.026)	(0.027)	(0.026)
Program transfer			-0.024	-0.024	-0.013
			(0.016)	(0.015)	(0.171)
Preschool				0.096**	0.080
				(0.037)	(0.040)
Literacy				0.088**	0.072
				(0.040)	(0.042)
Schools with differentiated enrollment				0.424***	
				(0.052)	
Student control	No	Yes	Yes	Yes	Yes
Person in charge characteristic	No	Yes	Yes	Yes	Yes
Teacher Control	No	No	Yes	Yes	No
School characteristic	No	No	No	Yes	No
School Fixed Effect	No	No	No	No	Yes
Observations	3.531	3.081	3.057	2.948	2.972
R-square	0.003	0.078	0.094	0.126	0.184

Source: Own elaboration based on data from Fundaj 2013. Notes: Standard error in parentheses. "Student control" includes the student's gender, race, body mass index (BMI), and whether the student has any disease. "Parental Controls" include family per capita income, higher education and high school dummies and the presence of those responsible for the student. "Teacher Control" includes the gender of the teacher, experience and age. "School Characteristics" include dummies that capture the size of the class, dropout level dummies, average daily dummies of absences and proportion of girls per class. Standard error adjusted for classes with clustering and heteroscedasticity. *** p <0.01, ** p <0.05, * p <0.1 indicates the level of statistical significance.

Table 1.3 shows several specifications[26] with OLS. Column (1) is the simplest specification, it has no control variable. In column (2) are added some variables of control of the student, of the parents and the socio-emotional abilities of the student. Column (3) includes variables related to the characteristics of the teacher: gender, experience and age. In addition, it includes whether the student has already been

[26] We also do not find evidence that the characteristics of attritors by missing observations differ between the treatment and control group. Specifically, we regress specifications 1–3 with the same number of observation on specification 4 and we got the same consistent results.

disapproved 1 or 2 times or more and if the student's family receives family scholarship. Column (4) adds controls pertaining to school characteristics. Column (5) uses an alternative way of controlling teacher and school characteristics through the fixed effects of the school, since in this way the model proposed in column (5) is more parsimonious and captures potential unobservable effects present in the school's characteristic.

It is emphasized that in column (1) to column (5) the R-squared increases as the number of variables is included in the models. Although the coefficient[27] of bullying between −0.043 and −0.056 on all models were significant at a level of 5%. These oscillations between the magnitudes of the coefficients occur because the control variables are correlated with the bullying, making the coefficients of the bullying overestimated. Thus, a possible reason for the decay is the inclusion of more variables to the models. In all models, the student's perception of having suffered bullying is negatively related to his performance in mathematics. According to column (5), students who have already undergone bullying have a lower performance of approximately 4.34%[28] lower than students who say they have not suffered bullying.

It is noticed that younger students perform better. Socio-emotional skills such as conscientiousness and extroversion also affect student grades, that is, the higher the student's conscientiousness[29] the worse his performance. And the more emotionally unstable the student, the lower his grade. These results are also found by Santos and Primi (2014).

In addition, students who failed once scored significantly below 5% of significance, but students who failed twice or more did not score significantly lower than students who did not fail. Column (4) shows that students who started their pre-school or literacy school perform better when compared to students who begin their school life later at a 5% level of significance. Finally, it should be noted that schools with a differentiated[30]

27 The math proficiency scale used in the Joaquim Nabuco Foundation survey refers to 20 items applied where each one worth 5 points, totalizing 100 points. In this way, the results suggest that students suffering from bullying have an approximate performance of one item less than students who do not suffer from bullying.

28 The dependent variable is log transformed.

29 Remember that the lower the conscientiousness, the better for the student, that is, he tends to be more perseverant and responsible.

30 These are schools in the sample that present different selection criteria from schools in the Recife public school.

enrollment system perform better when compared to other schools in Recife's public schools.

Table 1.4 reports the results of Propensity Score Matching. To estimate the average treatment effect on treated (ATT), we applied three methods: nearest neighbor matching with replacement and nearest neighbor matching without replacement, radius matching and Kernel matching. In all methods, bullying has a negative effect on students' scores at a 5% level of significance and the estimated parameter was considered even higher.

Table 1.4 - Impact of bullying on performance in mathematics with PSM

Matching method	Math score	Std. Err.	Std. Err. *boostrap*	Statistic T	Treated	Control
Nearest neighbor with replacement	-0.074***	0.024	0.024	-3.06	1.111	1.837
Nearest neighbor without replacement	-0.055***	0.019	0.017	-2.89	1.111	1.837
Radius/Caliper	-0.050***	0.018	0.019	-2.67	1.104	1.837
Epanechnikov Kernel	-0.054***	0.017	0.018	-3.01	1.111	1.837

Source: Own elaboration based on data from Fundaj 2013. Notes: Content common support. Standard error in parentheses. The default error estimated with 200 bootstrap replications is reported in brackets. *** p <0.01, ** p <0.05, * p <0.1 indicates the level of statistical significance.

In all of the estimated models, socio-emotional skills play an important role in reducing the student's likelihood of being bullied. According to Table 1.5 it can be noted that the student's emotional stability negatively affects the student's chance of being bullied. This result is also found by Sarzosa and Urzúa (2015) in which they verify that non-cognitive abilities[31] reduce the chance of suffering bullying[32].

[31] The authors work with locus of control, self-esteem and irresponsibility.
[32] The same procedure was performed with OLS and reported in Table 3A.

Table 1.5 - Role of non-cognitive skills - logit [33]

Bullying	Coefficient	Std. Err.	Statistic t	P value	Confidence Interval	
					Inferior limit	Superior limit
Boy	-0.01	0.08	-0.17	0.86	-0.17	0.14
White	-0.10	0.10	-0.97	0.33	-0.31	0.10
Black	0.31	0.11	2.65	0.00	0.08	0.55
Age	-0.18	0.05	-3.42	0.01	-0.29	-0.08
Underweight	-0.71	0.27	-2.55	0.01	-1.25	-0.16
Normal weight	-0.79	0.28	-2.84	0.00	-1.34	-0.24
Overweight	-0.43	0.30	-1.42	0.15	-1.03	0.16
Conscientiousness	0.05	0.04	1.30	0.19	-0.02	0.13
Extroversion	-0.02	0.04	-0.72	0.47	-0.10	0.05
Emotional stability	-0.36	0.03	-9.18	0.00	-0.44	-0.28
Disap. 2 times or more	0.41	0.19	2.17	0.03	0.04	0.78
Disap. 1 time	0.10	0.11	0.90	0.36	-0.12	0.32
Program transfer	0.06	0.08	0.81	0.42	-0.09	0.23
Scho. with dif. enroll.	-0.80	0.30	-2.60	0.00	-1.40	-0.19
Preschool	0.09	0.20	0.49	0.63	-0.31	0.51
Literacy	-0.07	0.21	-0.33	0.74	-0.50	0.35
Constant	2.69	0.87	3.07	0.00	0.97	4.40
Student control	Yes					
Person in charge characteristic	Yes					
Teacher control	Yes					
School characteristic	Yes					
Observations	2.948					

Source: Own elaboration based on data from Fundaj 2013. Notes: First stage of the nearest neighbor matching applied with replacement. Student control, Parental controls, Teacher control and School characteristics includes the same variables cited in model 4, of the Table 3.

For Carneiro et al. (2007) economists often have a simplified view on how non-cognitive skills act and can determine social and economic outcomes. This is partly because these abilities are intrinsically multidimensional. For the authors, these abilities can impact the behavior of individuals throughout life, as for example; the possibility of smoking at age 16, health status at age 42, employability at this age, among other factors. The study suggests that non-cognitive skills appear to be more malleable than cognitive abilities. An education policy aimed at such skills may be more effective in generating well-being than a policy that achieves only cognitive abilities.

Other facts also drew attention. The results suggest that black students are more likely to report being bullied and younger students are also more sensitive to bullying at a 5% level of significance. The results suggest that students with a BMI below healthy level and with a healthy BMI tend to report having suffered less bullying when compared to obese students at 5% significance. Finally, it is noticed that with a differentiated enrollment systems schools are less likely to declare students bullying.

[33] The same results were found with the OLS method.

Table 1.6 presents the results of the reweighting method (IPW) and the double robust technique (IPWRA). The results reveal the parameters of the weights estimators by the inverse of the propensity score and the double robust estimator. In both cases, the coefficients referring to the bullying variable are negative and significant at 5%.

Table 1.6 - Impact of bullying on performance in mathematics, ATT estimated from the IPW and IPWRA estimators

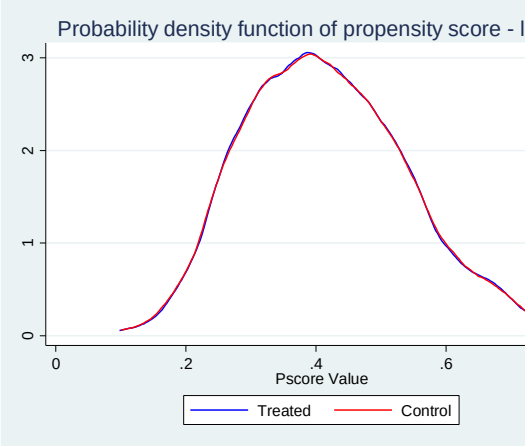
Variable	IPW Coefficient	Std. Err.	Z	IPWRA Coefficient	Std. Err.	z
Bullying	-0.047***	0.017	-2.65	-0.045**	0.017	-2.57

Source: Own elaboration based on data from Fundaj 2013. Note: * p<0.10, ** p<0.05, *** p<0.01.

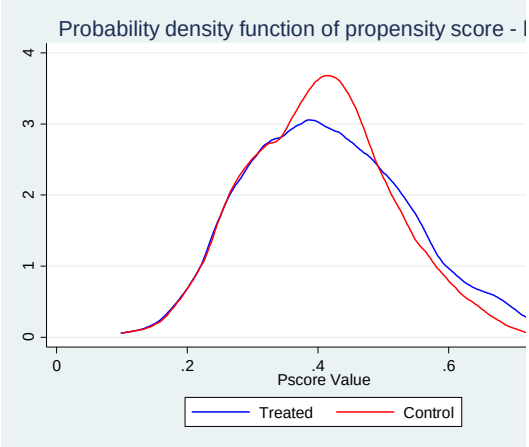
It is also important to check the common support hypothesis and the matching quality. The first one is verified from the graphical analysis, while the quality is analyzed from the covariates distribution between the treatment and control groups.

The common support hypothesis ensures that students with the same propensity score have a positive probability of being treated or untreated. One of the ways to test this assumption is through a graph. Fig. 1.2 compares the propensity score distribution of the two groups. The good adhesion of the pairing can be noticed when observing the distribution of the propensity score (Table 7).

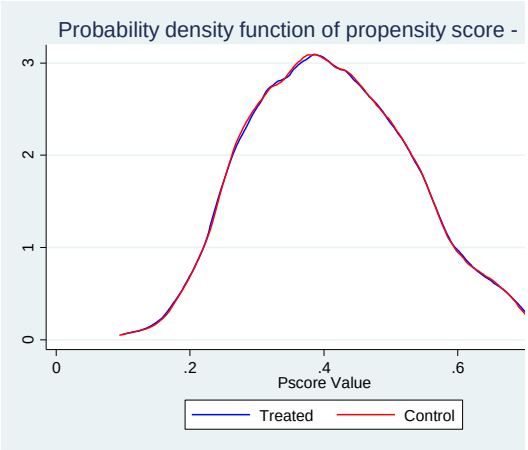
Figure 1.2- Kernel Density of the propensity score after pairing of 6th graders.



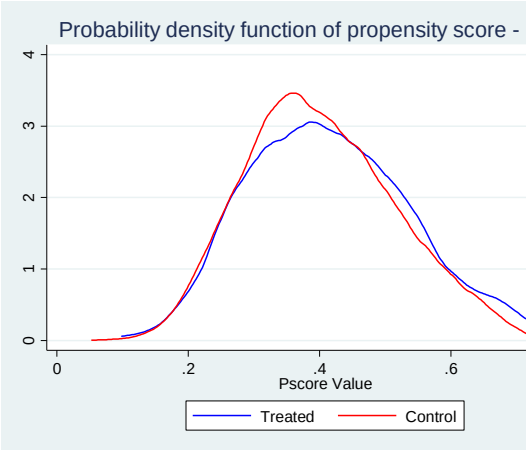
Nearest neighbor with replacement (1 obs)



Nearest neighbor without replacement (1 obs)



Radius matching



Kernel matching

Source: Own elaboration based on data from Fundaj 2013.

Another important procedure in this type of methodology is the checking of the balancing conditions. Table 1.7 shows the means of the variables in the treatment and control groups. After pairing, for all covariates it was not possible to reject the null hypothesis of equality of means and, therefore, one has a pairing with a good balance.

Table 1.7- Difference of means, before and after matching, between treatment and control groups

	Before Matching			After Matching		
	Treatment	Control	P-valor	Treatment	Control	P-value
Student Characteristics						
Boy	0.503	0.500	0.89	0.491	0.489	0.92
White	0.181	0.203	0.12	0.183	0.176	0.69
Black	0.145	0.108	0.00	0.142	0.151	0.57
Yellow	0.011	0.018	0.11	0.008	0.009	0.88
Indigenous	0.019	0.016	0.58	0.016	0.018	0.71
Age	11.65	11.67	0.58	11.60	11.60	0.90
Below ideal weight	0.512	0.532	0.27	0.510	0.508	0.92
Normal weight	0.375	0.389	0.42	0.380	0.383	0.86
Overweight	0.087	0.065	0.02	0.086	0.087	0.96
Disease	0.161	0.154	0.59	0.181	0.181	0.99
Conscientiousness	0.021	-0.035	0.15	0.015	0.018	0.95
Extroversion	-0.007	-0.002	0.90	-0.026	-0.034	0.85
Emotional stability	-0.224	0.138	0.00	-0.218	-0.221	0.95
Characteristics of those responsible						
Presence of the person in charge	0.039	0.000	0.33	0.029	-0.000	0.53
Family income per capita	208.25	217.59	0.19	210.1	210.03	0.99
Superior	0.011	2197	0.05	0.010	0.010	0.86
High school	0.314	0.352	0.04	0.318	0.309	0.68
Elementary School	0.522	0.567	0.01	0.528	0.527	0.99
Characteristics of teachers						
Female teacher	0.696	0.673	0.18	0.692	0.678	0.53
Teacher experience 1	0.111	0.112	0.95	0.111	0.109	0.91
Teacher experience 2	0.261	0.223	0.01	0.260	0.250	0.63
Teacher experience 3	0.122	0.146	0.05	0.120	0.128	0.63
Teacher experience 4	0.092	0.125	0.00	0.100	0.096	0.75
Teacher age 1	0.040	0.028	0.05	0.039	0.037	0.80
Teacher age 2	0.138	0.141	0.80	0.141	0.132	0.56
Teacher age 3	0.259	0.272	0.44	0.254	0.256	0.95
Teacher age 4	0.326	0.313	0.45	0.329	0.327	0.93
Characteristics of the school						
Class 1	0.018	0.017	0.78	0.012	0.013	0.96
Class 2	0.146	0.133	0.27	0.149	0.148	0.99
Class 3	0.492	0.485	0.70	0.480	0.479	0.96
Low drop out	0.831	0.877	0.00	0.846	0.851	0.79
Average drop out	0.145	0.106	0.00	0.133	0.126	0.65
Proportion of Girls	0.489	0.494	0.19	0.491	0.493	0.75
Schools with differentiated enrollment	0.014	0.032	0.00	0.017	0.014	0.62
Less than 30% and greater than 10%	0.167	0.162	0.72	0.168	0.161	0.68
Greater than 30%	0.008	0.0134	0.16	0.009	0.009	0.89
Variables of School Performance and Social Program						
Disapproved 1 time	0.073	0.074	0.87	0.064	0.069	0.69
Disapproved 2 times	0.205	0.195	0.49	0.201	0.198	0.84
Program transfer	0.604	0.577	0.14	0.596	0.592	0.86
Preschool	0.736	0.710	0.12	0.737	0.738	0.96
Literacy	0.209	0.241	0.03	0.223	0.223	0.99

Source: Own elaboration based on data from Fundaj 2013. Notes: Common support satisfied. Radius caliper is applied.

One of the assumptions of PSM is conditional independence assumption, that is, the vector of observable variables contains all information about the potential outcome in the absence of treatment. The placebo regression is used to test this assumption. For this, we selected all the variables used in the estimation of propensity score, but with a

new dependent variable that we assumed to be exogenous to the treatment. If there is any omitted variable correlated with the treatment, it is expected that the estimated coefficient of bullying is statistically different from zero, otherwise the hypothesis of CIA is assured.

1.6 Robustness analysis

This section provides the robustness analysis of the results. The regression method is still used to test the unconfoundedess assumption to analyze the placebo effect.

We use the gender of the teacher allocated in the math classes, since this variable is independent of the student performance. Table 1.8 shows the results of the placebo regression. Note that it was not possible to reject the null hypothesis of the bullying variable, suggesting that omitted variables that are related to the treatment do not exist.

Table 1.8 - Estimated placebo outcomes by OLS

	(1)	(2)
Bullying	0.018	0.010
	(0.019)	(0.018)
Other Controls	No	Yes
Observations	3.531	2.948[34]
R-squared	0.000	0.403

Source: Own elaboration based on data from Fundaj 2013. Note: 'Other controls' refers to all controls used in model 4 of Table 4. Standard error adjusted for clusters with clustering and heteroskedasticity. *** p <0.01, ** p <0.05, * p <0.1 indicates the level of statistical significance.

1.6.1 Sensitivity analysis

This section provides a sensitivity analysis[35] proposed by Rosenbaum (2002) that seeks to evaluate the potential impact of selection bias arising from unobserved variables. For this, we used different values of that measures the difference in the chance of receiving the treatment between the observations with the same observable characteristics, to verify the changes in the inference due to the existence of unobservable confounding factors. Table 1.9 shows the results for ranging from 1 to 1.5 and the corresponding p-value limit values.

[34] We find the same result when we run the same number of observation in column 1.
[35] Due to the non-experimental character, the concern with the bias of omitted variables is relevant.

Table 1.9 - Sensitivity analysis for the Mathematics grade

Γ	p-crit+	p-crit-
1.02	0.00	0.00
1.05	0.00	0.00
1.08	0.00	0.00
1.1	0.00	0.00
1.13	0.00	0.00
1.15	0.00	0.00
1.18	0.00	0.01
1.20	0.00	0.03
1.23	0.00	0.06
1.25	0.00	0.10
1.27	0.00	0.16
1.30	0.00	0.24

Source: Own elaboration based on data from Fundaj 2013.

The sensitivity analysis indicated potential problems of omitted variables. Table 9 reveals that the critical gamma value Γ is between 1.25 and 1.27 for the kernel method, considering the ATT for the math grade of the students. This result indicates that the paired students are apparently similar in terms of their observable characteristics and that they are part of the common support region, may differ in their probabilities of participating in the treatment (bullying) by a factor of up to 1.25 that the results of the ATT remains unchanged.

1.7 Final considerations

This work aimed to evaluate the impact of bullying on the mathematics performance of 6th grade elementary school students in the public schools of Recife city, using the Ordinary Least Squares and Propensity Score Matching methods, applying robustness tests and sensitivity analysis proposed by Rosenbaum (2002).

For Kibriya et al. (2015) quantitative analyzes that seek to understand bullying in developing countries are rare. This work aimed to fill this space in the national literature through a study using the data resulting from the research conducted by the Joaquim Nabuco Foundation in the year 2013. The main analysis was based on the suffering of bullying reported by the students, and it was observed that this phenomenon has a significant and negative impact on mathematics. In addition, the findings suggest that social-emotional skills can help students cope with bullying. Thus, programs to combat the practice of bullying may have special attention with non-cognitive skills.

Several econometric techniques have been used to overcome problems of endogeneity. In addition, robustness tests support the results found. The sensitivity test proposed by Rosenbaum (2002) indicated that the results are sensitive to the presence of omitted variables. A similarly designed experiment used by Bursztyn and Jensen (2015)

can help identify how much of a student's performance decrease is explained by the consequences of bullying and how much of that decrease is purposeful, since students can study less for the purpose of avoiding social costs.

This paper highlights the importance of new research involving the influence of the network of friendships in the classroom. An unprecedented factor in the Fundaj database for Brazil is the information regarding the student's network of friends within the classroom. This network of friendships was explored by Raposo (2015), with the aim of identifying peer influences on individual school performance. The authors identify a positive and significant effect of direct friend’s school performance on individual school outcomes. New studies that seek to explore the network of friendship of students involving bullying can contribute to this theme.

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APPENDIX A - The information used to create the scores of the non-cognitive abilities and the variable presence of the responsible

Conscientiousness

Do you like going to school? Do you do math homework? How often do you study the school subjects? When you have a test do you usually study only the day before the test? Do you read comic books or story books? Will I finish high school? I'm going to college

Extroversion

I am a popular person, I have many friends? Is the student physically attractive? Does the student have an attractive personality (is he charismatic)? Is the student extremely shy?

Emotional Stability

Do you feel left out in your classroom? I like myself the way I am? Would I change something physical in myself? Would I change anything in my personality? Am I trying to lose (gain) weight? Would I change my family if I could? I would like to study in a different school

Presence of the person in charge

Are you on the school board? This year, have you talked to a school teacher about how the student [speaking name] is going? Do you check the student's report card? If the student [name] gets a good grade, do you usually praise?

3 IS IT POSSIBLE TO DEVELOP SOCIAL-EMOTIONAL SKILLS OF ADOLESCENTS? EVIDENCE FROM BRAZILIAN PROGRAM

2.1 Introduction

The relevance of the present research can be understood based on two distinct factors: as it analyses the impact of a particular program it opens precedent for other programs to be analyzed and the reflection upon certain results indicate best ways to move forward, knowing what might be more effective in terms of its educational goals. Adding to that, we must point out how relevant it might be to a society the subject of this: the education and future success in life of the youth, which might be enhanced through the development of socioemotional skills.

Government policy implementations carried out by State Governments and Non-Governmental Organizations need to have a clear evaluation of results in order to use their resources more efficiently. Despite its importance, the evaluation of public policies is still not that common, although it has been growing recently. (MENEZES-FILHO, 2010). This research is highly focused on understading results through data, and applying this analysis in the future to further improve the program.

Academia Educar is the first project developed by Fundação Educar DPaschoal and began to be idealized in 1989[36]. The project promotes the training of young leaders in public schools, creating opportunities for 13 to 16-year-olds to discover their natural capabilities, empowering them to transform the reality of their schools and communities. The project is based on the four pillars of education established by UNESCO: Learning to Be, Learning to Live, Learning to Learn and Learning to Do.

For the evaluation, two field surveys were carried out. First, the diagnostic questionnaire was applied to all students in the treatment and control group. This initial research, conducted in March 2016, aimed to know both the socioeconomic characteristics of each student and their cognitive and socioemotional skills. The second round of questionnaire was taken in November of the same year to collect only information related to the students' socioemotional and cognitive competences. On both occasions, the students were responsible for completing the questionnaires applied.

36 Since its inception, the program has trained more than 4,000 young people. For more information, consult the website (http://www.educardpaschoal.org.br/)

The present study seeks to evaluate the impact of the Academia Educar program in 2016. To estimate the causal effect, two control groups are considered, in order to mitigate possible estimation biases. The first control group is formed by the students of the State School (EE) Profª. Maria Julieta de Godoi Cartezani, who had no students selected to participate in the Academia Educar project in 2016. In this case, 186 students were selected for the control group. Using a control group of students from another school has the advantage of avoiding the contagion caused by students in the treatment group.

For the second control group, 41 students from EMEF[37] Odila Maia Rocha Brito, a school with students participating in the project, were selected. There is a concern in this analysis with knowledge that was taught being passed along to other students of the school, since this transfer was a part of the project itself. That is why having a control group within the school might have led to an underestimation of the impacts of the project. Due to the low number of students selected in this control group, we used these students with the control group cited above for a validation check of the results.

To investigate the effect of the Academia Educar program on impact indicators, the students selected to receive the intervention in 2016 (treated) with the students who did not receive the intervention (control) were compared. For this, a combination of the propensity score method with Differences in Differences[38] is used. Several robustness analyzes were performed to validate the results found. In general, the results indicate positive and significant impacts on the Sociability, Assertiveness of students and on the interest in participating in national politics. For the Locus Control and Imaginative variables, the results were not conclusive. For the variable Volatility, in all estimates, the results did not indicate that the program had an impact.

All this program analysis focuses primarily on the understanding of improvements on perceived socioemotional skills as it lays upon the premise that those skills can be a proxy to individuals success, which relates to the Academia Educar's own objective and is a matter of investigation in researches as we can better explore in the upcoming paragraphs.

There is a meager amount of impact analysis of programs that seek to promote individual and collective success by developing socioemotional skills. On the other

37 Municipal School of Elementary Education.
38 For further details, see Heckman, Ichumura and Todd (1997, 1998).

hand, several studies examine the effects of cognitive ability, such as Farkas et al (1997), Murnane et al. (2000), Kerckhoff et al. (2001), Farkas (2003), Riani and Rios-Neto (2008). Recently, researchers have begun to investigate the role of non-cognitive skills and their applications, Sarzosa and Urzúa (2015) and Oliveira et al. (2017) investigate how social-emotional skills help mitigate the effect of bullying. Cunha et al. (2010) show that individuals with more non-cognitive skills in childhood are more likely to increase their cognitive indicators and Gensowski (2012) shows how lifetime financial gains are influenced by education and personality traits.

Lleras (2008) shows that non-cognitive behaviors measured in high school have significant effects on later educational achievement and higher income. These effects appear to be as important and perhaps more important than cognitive abilities in determining outcomes. However, the benefits of skills and behaviors are different from the groups. For example, non-cognitive behaviors seem to play a more important role in explaining the female and Asian advantage in educational attainment compared to cognitive ability.

Many researchers have attempted to understand how academic performance and cognitive ability have determined social performance and schooling. Some early researchers point out the importance of non-cognitive skills, as good predictors of success in life were Bowles and Gintis (1976).

According to Carneiro et al. (2007), economists often have a simplified view on how socioemotional skills act as the determinants of economic and social outcomes. This is because these abilities are intrinsically multidimensional. This study also identifies how non-cognitive skills affect the possibility of young people smoking at age 16, health status at age 42, employment status at age 42. The work suggests that non-cognitive skills appear to be more malleable than cognitive abilities. If this is true, an education policy that focuses on non-cognitive skills may be more effective at generating increased social and economic outcomes than one that targets only cognitive abilities. Almlund et al. (2011) also consider more malleable personality traits throughout the life cycle than cognitive ability, which becomes highly stable at around 10 years of age. His work suggests that interventions are capable of changing personality traits and promising ways to address poverty and disadvantage.

A survey conducted by the National Center for Workplace Education (NCEQW) in 1995 asked employers to rate some characteristics or attributes regarding their criticality in the hiring decision. Employers tend to minimize school-based factors in making their

decisions. Characteristics and attributes, such as the candidate's attitude, communication skills, previous work experience, and current employers' recommendations, seemed to be more important than full years of schooling, test scores, academic performance and teacher recommendations (STASZ, 2001). In 1997, the NCEQW achieved the same result, suggesting that the view on skills persists over time, even when economic conditions and overall labor demands fluctuate, as Shapiro and Goertz (1998) argue.

Heckman et al. (2006) use data from the National Longitudinal Survey of Youth to verify that non-cognitive skills are at least as important as cognitive abilities to explain some social performances in life. For example, non-cognitive skills seem to have a strong influence in making decisions about school choice, work and occupation. The authors point out the importance of including these skills in explaining the likelihood of one engaging in risky behavior.

There are different options when trying to measure the personality traits of an individual. Mischel et al. (1989) used an experiment called the Marshmallow Test, which showed that 4-year-old children with greater ability to postpone rewards tend to be smarter, more likely to have greater social responsibility, and postponement time is significantly related to higher grades in the SAT[39]. These results suggest that the relationship between the delaying the reward and the ability to cope with a range of social and personal problems is not entirely attributable to schooling.

Santos and Primi (2014) investigated the description of the socioemotional profile of students in Rio de Janeiro - Brazil, and Soto et al. (2011) investigated the profile of students in various places around the world and found similar results. In the above-mentioned studies, the data reflect that girls tend to be more conscious, extravagant and enjoyable. On the other hand, girls had less emotional stability. Both group of researchers used the "Big Five[40] Model", which was suggested as relevant for measuring personality traits in the context of education by Kyllonen et al. (2008). This same model is in parts used in this research in an attempt to understand students' characteristics and development throughout the process.

In addition to this introduction, a brief description of the Academia Educar project is presented below. Section 3 provides descriptive analysis of data from

39 SAT (Scholastic Assessment Test) is a standardized test widely used for college admissions in the United States.

40 It refers to the five personality factors. For more details, see McCrae and John (1992).

Academia Educar. Section 4 presents the identification strategy used and section 5 the results obtained. Finally, the last section brings the final considerations of the paper.

2.2 Description of the Academia Educar

The project works in partnership with 20 schools (10 municipal and 10 state) and has support from the Departments of Education East and West and Municipal Education Secretariat of Campinas-SP, receiving about 100 direct participants, 5 students from each of the schools.

In the Academia Educar, teenagers exercise their mind in workshops that happen twice a week, out of school hours (one class in the morning and another in the afternoon). They also develop, once a week, the multiplications, that is, workshops from 1h to 2h for other students of the schools participating in the project. These workshops have a responsible educator who helps in the performance of the students. In addition, there are some challenges developed throughout the year that contribute to the development of technical knowledge and social-emotional skills. The Academia Educar project wants to foster Youth Protagonism, wants to make them know their rights and duties as a citizen. The goal is for young people to be able to transform their reality, starting with their school and evolving all the way to reach their community. The target audience of the program is precisely the students of the public schools of Campinas, aged between 13 and 16 years who are studying from the 9th year of Elementary School II to the 2nd year of High School.

Several workshops are held with these young people with the aim of developing their leading role in their own context. The idea is that young people are able to lead projects that foster their community's development. In addition to the training, the participants are challenged and commit to carry out 8 projects engaging the entire community and replicating the knowledge acquired to the other students of the school, throughout the year. With respect to these projects at school, the idea is for the youngsters to identify needs within their schools and then come up with projects to address these needs. For example, if there is a problem of difficulty in reading in the school, the youngster may suggest Reading, Storytelling workshops and so on.

The project lasts one year (school year). There are 250 hours and 102 hours of training (which take place at DPK[41] Campinas, twice a week - Tuesdays and Thursdays,

41 Company of the DPaschoal Group specialized in the distribution of auto parts for the whole national territory.

within 3 hours) and 148 hours, 148 hours dedicated to the production of the 8 challenging projects: Multiplication in school; Station Experience; Oasis Educar; Catavento de Letras; Catavento de Números; Knowing the world; School Project and Closing Show.

The State Department of Education delegates to the Directorates West and East the indications of the schools seeking to contemplate the various districts of each region and also receive indication of desire for renewal manifested by the Educar DPaschoal Foundation of the schools that have participated in previous years. The Municipal Secretariat sends a communication via e-mail to the municipal schools and those that express interest are contemplated by order of arrival.

Once the participating schools have been defined, they must indicate who will be the teacher of the school in the Educar project. There is always a school educator who acts voluntarily. In the Academia Educar, the educators of the schools are a core part in the process of development of the juvenile leadership. Each school has an educator that supports the project. Participating schools must share with the values of the Academia Educar.

At Academia Educar, the idea is to help develop youth to become leaders who are capable of initiating change and one of the keys to success in the project is in the presence of young tutors[42]. These young people, after passing through the development period as students, are invited to become tutors for the next batch of students in the following year. They hold weekly meetings to create the workshops according to the proposed theme. In addition, each tutor "sponsors" some schools to follow the multiplications with the students, giving tips and enhancing the development of the beginners and the results obtained in the project.

Another important point in this process is the choice of students who will participate in the program. First, staff at the Educar DPaschoal Academy team announces the program to their students. Afterwards, the young people interested participate in a group dynamic, conducted by the technical staff of Academia Educar, which lasts from three to four hours and takes place in school. From this group dynamic, the Educar DPaschoal Foundation team and the young tutors select which students will join the Academia Educar of the year.

42 There are 10 young people who participated as monitors in the class of 2016.

The eligibility criteria are: to be enrolled between the 9th year of the high school and the 2nd year of the middle school in public schools that adhered to the project in the current year and between 13 and 16 years old. However, during the group dynamic, the technical staff of the Academia Educar mainly observes the interest and willingness of the student to participate. Secondly, they also observe the posture under pressure, initiative, cooperation / teamwork, commitment, flexibility, among others. It is based on these abilities that the team decides who will be selected. In short, criteria such as the commitment and willingness of young people to participate are major deciding factors.

2.3 Descriptive Analysis

In this section, we describe the data used for the impact assessment of the Academia Educar 2016 project. We present the information regarding the treatment group and then those of the control group. In addition, a friction analysis is performed. Finally, a subsection presents a simple comparison of the treatment and control groups in the pre-intervention and post-intervention periods.

An important analysis is the friction of students in the treatment and control group. Friction is the loss of observations (relative to the initial design) that occurs in a field survey. Every program has the objective of treating all its candidates, however, a part of the candidates leaves the treatment for several reasons. Thus, when we return to the field to interview students after treatment, a portion of the initial sample is lost. The same may occur for the control group. In the case, we had a friction of 25% in the treatment group and 21.14% in the control group - these numbers are precisely the difference between the ideal response rate (without friction) and the observed response rate.

Inferences may be biased if this friction is not random, that is, when individuals who did not respond to the (second) survey are different from the group as a whole. To verify that the field friction did not mischaracterize the initial sample, generating a sample selectivity, are compared the initial treatment[43] and control[44] groups with the

[43] The treaties that left the Program do not differ from the total initial sample. In terms of their observable characteristics they showed no significant divergence at 90% confidence.
[44] Only the variable Volatility was statistically significant (10% significance when the control group was formed by the students of the school in which there was no treaty and 5% of significance when we grouped the youngsters of the two schools to form the total control group).

sample that did not respond to the final field survey using the variables collected at the initial time of the Academia Educar survey.

In the pre-treatment period, the participants of the Academia Educar project are the students of the 9th year of Elementary School II, 1st and 2nd year of High School, respectively 49.3%, 46.6% and 4%.[45] The students in the treatment group are 36% boys and 64% girls. According to Table 1, the average age of the boys is around 14 years, with a minimum of 13 and a maximum of 16 years.

Regarding schooling of the student's parents, 61.3% of these parents present a level of schooling up to the 5th year of Elementary School, 28% of them have completed High School and 10.6% did not specify. Regarding the level of schooling of the mother, 62.6% have a level of education up to the 5th year of Elementary School, 34.6% have completed High School, 2.6% did not specify. In relation to family income, 93.3% have an income between R $ 0.00 and R $ 3,000.00.

Regarding the students in the control group, Table 2.1 shows that 6.7% of the young people are 8th grade students, 44.6% are 9th year of Elementary School II and 48.6% of students are attending the 1st year of high school. The control group consists of 47.5% girls and 52.5% boys. The average age of young people is around 15 years.

The schooling of the parents is composed of 88.3% up to the 5th year of Elementary School and 10.6% present the complete High School. The level of education of the mother up to the 5th year of elementary school is 85.4% and with high school is 14.5%. The family income is formed by 79.8% with income between R$ 0.00 to R$ 3,000.00, and with income over R $ 3,000.00 is 20.1%.

2.3.1 Descriptive analysis of treatment and control group in pre-intervention and post-intervention

As previously explained, the data collection for the evaluation occurred in two phases. At the first moment (baseline), the students answered a questionnaire about their socioeconomic characteristics and socioemotional competences. After the intervention of the program, the students of the treatment and control group answered again the questionnaire about their social-emotional abilities. Table 2.1 presents the information regarding the treatment and control groups in the pre-intervention period.

[45] Only the students who answered the two questionnaires were considered.

Table 2.1- Descriptive statistics of the treatment group and pre-intervention control

	Treated			Control	
	Mean	**Stand. deviation**	**Statistics T**	**Mean**	**Stand. deviation**
Indicators of impact					
Control Locus	2.561	0.065	-2.276**	2.375	0.046
Obs	53			113	
Sociability	3.127	0.063	1.808*	3.295	0.056
Obs	52			109	
Assertiveness	2.920	0.115	0.869	3.040	0.076
Obs	69			160	
Volatility	3.147	0.095	1.391	3.309	0.065
Obs	62			131	
Imaginative	3.166	0.106	0.361	3.213	0.072
Obs	57			122	
Political Participation	0.466	0.057	-1.455	0.368	0.036
Obs	75			179	
Student Variables					
Age	14.440	0.076	6.211***	15.057	0.056
Obs	75			174	
Boy	0.360	0.055	2.422**	0.525	0.037
Obs	75			179	
8º Year	0	0	2.312**	0.067	0.018
Obs	75			179	
9º Year	0.493	0.058	-0.674	0.446	0.037
Obs	75			179	
1st Year of H. S.	0.466	0.057	0.280	0.486	0.037
Obs	75			179	
2st Year of H. S.	0.040	0.022	-2.720***	0	0
Obs	75			179	
Sch. of the Father - Elementary	0.613	0.056	5.490***	0.893	0.023
Obs	75			179	
Sch. of the Father - High School.	0.280	0.052	-3.541***	0.106	0.023
Obs	75			179	
Sch. of the Father - Declared	0.106	0.035	-4.604***	0	0
Obs	75			179	
Sch. of the Mother - Elementary	0.626	0.056	4.174***	0.854	0.026
Obs	75			179	
Sch. of the Mother - High School	0.346	0.055	-3.712***	0.145	0.026
Obs	75			179	
Sch. of the Mother - Declared	0.026	0.018	-2.205**	0	0
Obs	75			179	
Income up to R$ 3,000.00	0.933	0.028	-2.626**	0.798	0.034
Obs	75			134	
Higher Income R$ 3,000.00	0.066	0.028	2.626**	0.201	0.034
Obs	75			134	
Cognitive Skill	0.413	0.072	-7.150***	0.072	0.019
Obs	75			179	
Books 0 to 3	0.513	0.058	1.356	0.603	0.036

Obs	74			179	
Books More than 3	0.486	0.058	-1.315	0.396	0.036
Obs	74			179	
Access to Cultural Goods 1	0.106	0.035	2.268**	0.229	0.031
Obs	75			179	
Access to Cultural Goods 2	0.546	0.057	-1.369	0.452	0.037
Obs	75			179	
Access to Cultural Goods 3	0.346	0.055	-0.436	0.318	0.034
Obs	75			179	
Grammar questions 1	0.733	0.051	-2. 466**	0. 569	0. 031
Obs	75			179	
Grammar questions 2	0.520	0.058	-2.878***	0.329	0.035
Obs	75			179	

Source: Own elaboration based on data from Academia Educar 2016. * 90%, ** 95% and *** 99% confidence.

According to Table 2.1, it can be noted that the variables: Age, Boy, 8º Year, 2st Year of H. S., Sch. of the Father – Elementary, Sch. of the Father - High School., Sch. of the Father – Declared, Sch. of the Mother – Elementary, Sch. of the Mother - High School, Sch. of the Mother – Declared, Income up to R$ 3.000,00, Higher Income R$ 3.000,00, Cognitive Skill, Access to Cultural Goods 1, Grammar questions 1, Grammar questions 2, Locus of Control and Sociability are statistically different between the treatment and control groups, with at least 90% confidence. This result is expected due to the non-random selection of students to attend the Academia Educar.

According to Table 2.1, the treatment and control groups are statistically different in the abilities Locus of Control[46] and Sociability. The treatment group presents students with greater emotional instability (Locus of Control) and has a lower degree of sociability. For the other non-cognitive skills, students in the treatment and control group are statistically similar.

Table 2.2 presents the information regarding the treatment and control group before and after the intervention of the program.

[46] The greater the value of the locus of control, the more unstable the student is in terms of his emotional stability.

Table 2.2 - Descriptive statistics of treatment and control groups before and after the program

Treat. before				Treat. after	
	Mean	**Stand. deviation**	**Statistics T**	**Mean**	**Stand. deviation**
Lócus de Control	2.561	0.065	4.767***	2.154	0.054
Obs	53			53	
Sociability	3.127	0.063	-5.225***	3.663	0.080
Obs	52			52	
Assertiveness	2.920	0.115	-4.687***	3.623	0.095
Obs	69			69	
Volatility	3.147	0.095	-1.838*	3.400	0.098
Obs	62			62	
Imaginative	3.166	0.106	-3.021***	3.583	0.087
Obs	57			57	
Political Participation	0.466	0.057	-7.197***	0.933	0.028
Obs	75			75	
Control before				**Control after**	
Lócus de Control	2.375	0.046	-1.278	2.457	0.043
Obs	113			113	
Sociability	3.295	0.056	-0.654	3.345	0.049
Obs	109			109	
Assertiveness	3.040	0.076	-0.086	3.050	0.077
Obs	160			160	
Volatility	3.309	0.065	0.979	3.213	0.071
Obs	131			131	
Imaginative	3.213	0.072	0.171	3.196	0.062
Obs	122			122	
Political Participation	0.368	0.036	-0.434	0.391	0.036
Obs	179			179	

Source: Own elaboration based on data from Academia Educar 2016. * 90%, ** 95% and *** 99% confidence.

It is possible to observe that after the intervention the students are statistically different to 90% confidence in all socioemotional skills and political participation. The only variable that decreased value refers to control locus, where lower values mean more emotionally stable students. For all other characteristics the values increased, revealing that after the intervention students improve their non-cognitive skills and political participation.

It is also noted that the control group before and after intervention are similar in terms of their socioemotional characteristics and political participation. This result is a good indication, as students who did not participate in the Academia Educar program, further reinforcing the results found for the treated students.

2.4 Empirical strategy

2.4.1 Identification hypothesis

The objective of the Academia Educar project is to provide young students with the development of their socioemotional competencies through the protagonism and knowledge of their rights and duties as citizens, so that they are able to transform their reality and their community.

To investigate the causal relationship of these factors several experimental and non-experimental techniques are used in the impact assessment literature. Among them, the method of differences in differences is widely used by researchers, either alone or in combination with other methods[47]. This research uses quasi-experimental techniques to identify the causal relationship of the program to the indicators of interests.

To estimate the causal effect, two control groups are considered, in order to mitigate possible biases of estimation. The first control group consists of students from a school that does not have students belonging to the program, 186 individuals. This control group has the advantage of avoiding the contagion caused by the students of the treatment group, as discussed in section 2. The second control group is formed by students from one of the participating schools, 41 individuals; totaling 227 students. This second control group is used as a way of testing the robustness of the results.

The school not participating in the program chosen for the control group is similar to the schools that participate and is also easier to access to the project management team. The groups that answered the questionnaire were from the same grades that participated in the project and all the students present on the day answered the questionnaire. At the end of the year, the Educar team returned to these same classes.

When selection for participation in a program occurs randomly, this mechanism provides the necessary balancing of observed and unobserved characteristics of the units that make up the two groups, Angrist and Pische (2008). Randomization allows us to create a situation in which there is no correlation between being treated and the attributes of the observation units (participants). If the exposure to the policy is random, one can compare two groups: one that received the program (treatment group) and one that did not (control group). Then, the difference in students' performance in the two situations (treatment and control) is calculated to evaluate the impact of the program.

[47] The propensity score and the method of differences in differences were proposed by Heckman, Ichumura and Todd (1997, 1998).

However, due to the non-random selection of the Academia Educar program, this procedure is not the correct one to apply. As shown in Table 2 of section 3, it is noted that the treatment and control groups are distinct in terms of their observable characteristics before the intervention.

Due to the significant differences between the treatment and control groups, the propensity score method is used. This method allows finding young people of the control that are as close as possible to the treaties. Pre-project information regarding student demographics, socioeconomic backgrounds (parental schooling, family income, etc.) and cognitive ability (questions of logic applied to the questionnaire) will be used to make these students look alike[48].

In addition, since we collected information on our impact indicators of interest at the beginning of the evaluation, we will also use the difference-differences method. This method allows us to eliminate unobservable differences that are fixed in time. The causal effect of the program can be found statistically. To validate the causal effect, several robustness tests will be performed, since the method used is not without problems.

This strategy allows to estimate the effect of the treatment, that is, the impact of the intervention of the Academia Educar on the social-emotional abilities of the participants of the state and municipal public schools of Campinas / SP. The main hypothesis of the differences in differences method is that the temporal trajectory of the outcome variable for the control group represents what would occur with the treated group, in the absence of the intervention, Menezes-Filho et al. (2012). In our case, it is necessary that the average of the social-emotional abilities have pre-treatment[49] trajectory parallel to that of the participants of the control group.

The effect of the program on treaties can be formally represented as:

$$D_{t_0,t_1} = E\left[Y^1_{it_1} - Y^0_{it_0} \middle| T_i = 1, X_i\right] - E\left[Y^1_{it_1} - Y^0_{it_0} \middle| T_i = 0, X_i\right]$$

in which represents a socioemotional characteristic at time t_1 (after the adoption of the program) for the participant i. Note that is impossible to observe and represents a

[48] The variables used in the propensity score are: Boy, Age, Cognitive Ability Schooling Father Ens. M. Schooling Mother Ens. M. Student Education 2 Student Education 3 Major Income R $ 3,000.00 Books More than 3 Access to Cultural Goods 2 Access to Cultural Goods 3.

[49] Although not a test for this hypothesis, an intuitive way of checking is to test whether the trajectory of the outcome variable for the two groups has the same time trend.

socioemotional ability of participants in the control group after treatment if they were treated. For this parameter to correspond to the mean treatment effect on the treated, we need the following hypothesis:

$$E\left[Y_{it_1}^0 - Y_{it_0}^0 \middle| T_i = 1, X_i\right] = E\left[Y_{it_1}^0 - Y_{it_0}^0 \middle| T_i = 0, X_i\right]$$

That is, the temporal evolution of the groups of treaties and controls, in the absence of treatment, is exactly the same.

$$\text{Socioemocional}_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 AE_{it} + \beta_3 t_t + \beta_4 (AE_{it} t_t) + \varepsilon_{it},$$

$\text{Socioemocional}_{it}$ in which refers to a socioemotional characteristic of student i at time t; X_{it} are control variables; AE_{it} if participant i is treated, that is participates in the Academia Educar project, and 0, otherwise; t_{it} is a time dummy that assumes the value 1 in the post-program period and 0 in the pre-program period and ε_{it} is the error term of the model.

In sum, the hypothesis of causal evaluation of the Academia Educar program on indicators of interest uses: i) the observed variables pretreatment that allows to select from the control group those more similar to those treated; ii) the unobserved differences are fixed over time. The combination of these two methods - matching and differences in differences - allows us to identify causality and measure the impact of intervention. Several robustness tests will be performed to validate the results.

2.4.2 Impact indicators of interest

As stated in section 2, the objective of the Academia Educar project is to "promote the formation of youth leaderships in public schools, creating opportunities for young people to discover their potential and transform their reality." In short, two measures would satisfactorily address this goal: youth protagonism and citizenship[50]. However, we do not find anything so specific in literature. Therefore, we seek measures correlated with these two aspects. The idea was to use SENNA items.

The SENNA (Social and Emotional or Non-Cognitive Nationwide Assessment) is an instrument developed by the Ayrton Senna Institute, in partnership with the OECD, which consists of measuring the socioemotional competences of students in the 5th year

[50] School learning can also be an indicator to be considered. But, the option was to focus on indicators related to protagonism and citizenship.

of elementary school to the last year of high school. The issues that make up the instrument relate to students' attitudes, feelings or perceptions about themselves. It has items to measure the Five Great Personality Factors, the so-called "Big Five": Opening to New Experiences; Extroversion; Kindness; Conscientiousness; and Neuroticism (Emotional Stability), McCrae and John (1992). The items vary in a Likert progressive scale ranging from 1 to 5, ranging from "totally disagree" to "strongly agree," according to a person's belief in having a particular personality trait or characteristic. In addition, the instrument also has items to measure Locus Control.

For this evaluation, we selected some SENNA[51] items. Specifically, we selected items that include the following facets: Sociability and Assertiveness, from the Extroversion construct; Volatility, from the construct Neuroticism; Imaginative, from the construct of Opening to the New; and the items referring to measurement of control locus.

Extroversion is defined as the orientation of interests and energy toward the external world, people, and things. The extroverted individual is characterized by his ability to communicate, assertiveness, sociability, and a tendency to draw attention to himself within a group. Among the facets are the sociability or ability to communicate with peers and the assertiveness or ability to know how to put his opinion. Socialization refers to traits that lead to prosocial attitudes and behavior, whose subjects are pleasant, warm, docile, generous, and loyal. Assertiveness is the social ability to affirm one's own rights and express thoughts, feelings and beliefs in a direct, clear, honest, and context-appropriate way so as not to violate the rights of others. Being assertive is saying "yes" and "no" when you have to.

Neuroticism refers to the instability / emotional stability of a subject, dealing with negative emotions such as anxiety, helplessness, irritability and pessimism. Volatility, the chosen facet, means having autos and lows, low resilience (ie, the person does not have a good recovery capacity after going through difficulties). People with high scores on this facet have just the opposite.

Opening to the New is a trait of people who readily accept to participate in new experiences. He who characterizes himself as "open to the new" tends to be imaginative, creative, and intellectually curious. From this construct, we select the items related to being imaginative.

[51] The SENNA questionnaire is available in the appendix.

Locus control is a psychological measure of a person's belief about the causal relationship between their own behavior and the results achieved. The control locus is defined as a continuum between two antagonistic spectra: external locus and internal locus. Individuals with locus of external control believe that they do not have control over the outcome of events in their lives, crediting them to external factors, even when faced with many opportunities. Individuals who have a locus of internal control feel that the events and achievements of their lives are the fruit of their actions rather than the result of actions and facts external to them.

These items were chosen because they are related to the skills that the Academia Educar team seeks to foster in the youth. Protagonism is related to having initiative - to propose ideas; to be able to mobilize, encourage cooperation or teamwork; commitment to goals; leadership. Citizenship is related to knowing their rights and duties - something not contemplated in the items, it is true - but also, to the idea that 'making it happen' depends on the young person, that is, he must assert his rights, something captured at the locus of control, for example.

Thus, the chosen impact indicators of interest are:

$Y_1 = \text{Locus of control}$

$Y_2 = \text{Sociability}$

$Y_3 = Assertiveness$

$Y_4 = Volatility$

$Y_5 = \text{Imaginative}$

$Y_6 = Political\ Participation$

It is important to clarify that in addition to the SENNA items, 'loose' items were also included in the proposed instrument to capture the impact indicators of the Academia Educar. These items were developed by the Academia Educar staff and are in line with the dimensions prioritized by the project. One of the issues included addresses the student's interest in participating in the country's politics. This issue has become one of the indicators of evaluation.

"Do you believe that you should participate in politics in your country?"

() No () Yes

The indicators from 1 to 5 were constructed, therefore, from a specific set of SENNA [52] items. For this investigation, 3 proposals were used to construct these indicators. The Locus control variable is constructed from 14 items belonging to the

[52] The likert scale is used in the SENNA questionnaire.

SENNA questionnaire, since the Sociability feature is constructed from 8 SENNA items. The variable Volatility is based on 6 items of the questionnaire, since the Imaginative feature is constructed based on 4 items and Assertiveness is constructed from 2 items of the SENNA questionnaire. Finally, the dependent variable Political Participation is a binary variable that assumes the value 1, in case the student believes that he should participate in the policy in his country and 0, otherwise.

Proposition 1 uses 34 items, proposal 2 uses all the items present in the questionnaire, that is, 49 items and proposal 3 is constructed from the items indicated by the factorial analysis. The questionnaire has five levels of responses, thus, for each competency was added the value given for each response and then divided by the number of items corresponding to each social-emotional characteristic. In this way, each characteristic has a numerical value between 1 and 5.

To measure the internal consistency of these indicators, Table 2.3 reports the Cronbach's Alpha, whose objective is to evaluate the magnitude in which the items of an instrument are correlated. The internal consistency is better the closer to 1 it is value. It is the reason that we use 3 proposals for building social-emotional skills. Although, there is no precise rule about alpha values, some authors consider the small internal consistency for alphas smaller than 0.21. For alpha between 0.40 and 0.21, the consistency is said to be reasonable. Values between 0.60 and 0.41 are considered moderate. If the alpha is between 0.80 and 0.61, the consistency is considered substantial and for values greater than 0.80, the instrument is almost perfect.

Table 2.3 - Cronbach Alpha Values

Socioemotional skills	Proposal 1	Proposal 2	Proposal 3
Locus of control	0.702	0.715	0.782
Sociability	0.446	0.473	0.642
Assertiveness	0.517	0.444	0.515
Volatility	0.625	0.578	0.642
Imaginative	0.563	0.562	0.531

Source: Academia Educar

According to Table 2.3, the different proposals present moderate and substantial results, Landis and Koch [53] (1977). The applied diagnostic questionnaire can satisfactorily construct the proposed socioemotional indicators.

[53] The authors consider values greater than 0.80 to have an almost perfect internal consistency, values of 0.61 to 0.80 are considered substantial, whereas values from 0.41 to 0.60 are moderate, from 0.21 to 0.40 is reasonable and less than 0.21 is considered small.

2.4.3 The control variables

In order to estimate the impact of the Academia Educar in 2016 on indicators of interest, a large set of characteristics of the students is considered, including age, gender, cognitive abilities, socioeconomic characteristics and family characteristics, as described in Table 2.2. These variables are used to define if the treatment and control groups are similar - when controlling for these observed variables we are reducing the potential bias from non-observable sources, that is, we seek to find the "clean" treatment effect.

The choice of these characteristics derives from the empirical literature and also from the database informed by Academia Educar. Control variables can be found in Frame 2.1.

Frame 2.1: Description of Control Variables

Variables	**Description**
Age	Age in years.
Boy	Assumes 1 if student declares males and 0 declares to be female.
8º Year	Assumes 1 if it is the 8º Year of Elementary School and 0 otherwise.
9º Year	Assumes 1 if it is the 9th year of Elementary School and 0 otherwise.
1st Year of H. S.	Assumes 1 if it is the 1st year of high school and 0 otherwise.
2st Year of H. S.	Assumes 1 if it is the 2nd year of high school and 0 otherwise.
Sch. of the Father - Elementary	Assumes 1 if the father has until the 5th year of Elementary School and 0 otherwise.
Sch. of the Father - High School.	Assume 1 if the father has high school and 0 otherwise.
Sch. of the Father - Declared	Assumes 1 if the father's schooling was not quoted and 0 otherwise.
Sch. of the Mother - Elementary	Assumes 1 if the mother has until the 5th year of Elementary School and 0 otherwise.
Sch. of the Mother - High School.	Assume 1 if the mother has high school and 0 otherwise.
Sch. of the Mother - Declared	Assumes 1 if the mother's schooling was not mentioned and 0 otherwise.
Income up to R $ 3,000.00	Assumes 1 if the family income is between R$0.00 up to R$3,000.00 and 0 otherwise.
Higher Income R $ 3,000.00	Assumes 1 if the family income is higher than R$ 3,000.00 and 0 otherwise.
Cognitive Skill	Assumes 1 if the student has hit at least one of the two logic questions and 0 otherwise.
Books 0 to 3	Assumes 1 if the student reads 0 to 3 books per year and 0 otherwise.
Books More than 3	Assumes 1 if the student reads more than 3 books per year and 0 otherwise
Access to Cultural Goods 1	Assumes 1 if the frequency of cultural goods is "never" and 0 otherwise.
Access to Cultural Goods 2	Assumes 1 if the frequency of cultural goods is "1 to 6 times a year" and 0 otherwise.
Access to Cultural Goods 3	Assumes 1 if the frequency of cultural goods is "monthly" and 0 otherwise.
Grammar questions 1	Assume 1 if the student is correct on the grammar question and 0 otherwise.
Grammar questions 2	Assume 1 if the student is correct on the grammar question and 0 otherwise.

Source: Prepared by the authors based on the Educar Academy data source.

2.5 Results

In this section, we present the results of the impact estimates for the indicators of interest. In the first subsection, the presented results are based on the model of differences in differences. The subsequent subsection presents the results from a combination of methods using the matching and difference in differences model, which are the preferred results because of the pre-treatment differences already observed between students in both groups.

2.5.1 Estimates of impact of the Academia Educar assessment on the indicators of interest - estimation through the differences in differences model

This section presents the results of the diferences in differences model. Table 2.4 presents the results with two different control groups. Control group 1 is made up of students from the E.E. Maria Julieta de Godoi Cartezani and EMEF Prof. Odila Maia Rocha Brito. Control group 2 is made up of students from the E.E. Maria Julieta de Godoi Cartezani, that is, by students who are in a school that does not participate in the Academia Educar project. The results with different control groups is one way of showing the robustness of the results.

Table 2.4 - Impact of the AE Program on several variables of interest (Proposal 1)

Variables	(1) Locus of	(2) Sociabil	(3) Assertive	(4) Volatili	(5) Imagina	(6) Politica
Control Group 1 - Students from both schools						
Program's	-	0.509**	0.406*	0.270	0.335*	0.444**
	(0.133)	(0.140)	(0.217)	(0.195)	(0.190)	(0.095)
Student fixed	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Student Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	332	322	458	386	358	506
"id" number	166	161	229	193	179	253
R-square	0.155	0.200	0.179	0.094	0.101	0.196
Control Group 2 - Only school students who do not have Treated (contagion)						
Impact of the	-	0.503**	0.375	0.236	0.293	0.448**
	(0.138)	(0.143)	(0.227)	(0.201)	(0.196)	(0.095)
Student fixed	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Student Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	298	292	404	350	330	440
"id" number	149	146	202	175	165	220
R-square	0.159	0.208	0.189	0.091	0.108	0.237

Source: Own elaboration based on data from Academia Educar 2016. * 90%, ** 95% and *** 99% confidence.

Table 2.4 shows that the Academia Educar program had an impact on the Locus competences of control, sociability and political participation. The negative sign of Locus of Control means that the students who participated in the program have

improved this competence, i.e., students feel more in control of their own lives, demanding more of themselves and focusing on what they can do on their own to deal with their respective problems. The impact on sociability and political participation are also in the expected direction, i.e., students who participated in the project presented greater variations in the indicators of sociability and political participation than students who did not participate in the project. The results for the variables Assertiveness and Imaginative were positive, but were only significant for control group 1; for control group 2, the impact results decrease in magnitude and are no longer significant. For the variable of interest Volatility, the results were not statistically significant for any of the control groups.

2.5.2 Estimates of impact of the Academia Educar assessment on the indicators of interest - estimation through propensity score and differences in differences model

This subsection presents the results from a combination of methods, using the propensity score and the difference in difference model. This method allows individuals to be searched in the closest[54] control group and uses the results of these individuals to obtain what would be the outcome of the individual in the treatment group if they were not treated.

First, based on the vector X described in Frame 1, we estimated an equation for the probability of the individual participating in the treatment. This procedure was performed separately for each dependent variable analyzed, as well as for each control group. Then, the kernel matching[55] estimates were obtained. In Appendix B are presented the logit models for the probability of the individual being treated (Table B1), as well a balanced quality analysis (Table B2 and Table B3). Table 2.5 presents the results of the program.

[54] Also called selection in observables, Rosenbaum and Rubim (1983).

[55] Each treated student is paired with a weight for each untreated student, so weight declines as the distance of the propensity score between treated and untreated students increases.

Table 2.5 - Impact of the AE Program on several variables of interest - results through propensity score (Proposal 1)

Variables	(1) Locus of control	(2) Sociability	(3) Assertiveness	(4) Volatility	(5) Imaginative	(6) Political Part.
Control Group 1 - Students from both schools						
Impact of the Program	-0.275**	0.389***	0.428**	0.126	0.081	0.533***
	(0.136)	(0.138)	(0.195)	(0.235)	(0.224)	(0.102)
Student fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Student Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	254	246	348	284	276	380
"id" number	127	123	174	142	138	190
R-square	0.165	0.278	0.220	0.385	0.225	0.430
Control Group 2 - Only school students who do not have Treated						
Impact of the Program	-0.090	0.396***	0.463**	-0.028	-0.568**	0.420***
	(0.149)	(0.141)	(0.207)	(0.233)	(0.272)	(0.086)
Student fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Student Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	236	222	314	272	242	344
"id" number	118	111	157	136	121	172
R-square	0.156	0.316	0.254	0.317	0.240	0.384

Source: Own elaboration based on data from Academia Educar 2016. * 90%, ** 95% and *** 99% confidence.

According to Table 2.5, participation in the Academia Educar project has an impact on the variables of interest Sociability, Assertiveness and Political Participation. For Locus control, the result was only significant for the control group 1. Compared to the results in Table 2.4, the positive results remained for Sociability and Political Participation.

The treated before the intervention were less sociable than the control and after the program the sociability was even greater. This result is expected because of the program's operation, since young people work too hard this skill during the program. Regarding political participation, there was no significant difference before the program and after the Academy Educate the treaties have a greater political participation. This is also expected because of the character of the program, which seeks to foster the youth protagonism, wants to make them know their rights and duties as a citizen.

Again, no impact was observed on the variable 'Volatility'. For the Imaginative variable, the results indicate null impact for Control Group 1 and negative when we consider Control Group 2. The negative result for Imaginative is not found in other specifications, most of the time the models suggest a positive impact, but statistically insignificant.

Table B4, in Appendix B, presents estimates for the same models from Table 2.4, but using other pairing algorithms - specifically, matching by the nearest neighbor. We worked with 1 and 2 neighbors, always with replacement, that is, the same observation of the control group could be combined with more than one treated unit. As can be observed, the results of Table 2.4 are confirmed: positive and significant impacts for Sociability, Assertiveness and Political Participation. In these specifications, however, Imaginative appears with a positive and significant signal for control group 1 and not significant for control group 2. No significant and consistent impacts are estimated for Locus of Control nor for Volatility, results also already pointed out in Table 2.5.

As previously stated, one of the ideas was to explore different ways of constructing the socioemotional measures used in this evaluation. Thus, in tables B5 and B6 of Appendix B, the same results are shown in Table 2.5 and Table B4 in the Appendix, but using these alternative proposals for measures of social-emotional indicators. Table B5 presents the results for proposal 2 and table B6 for proposal 3. In these tables of the appendix no results are presented for the variable of political participation since it is derived from a single question of the questionnaire, therefore, there are no different possibilities of measurement for this variable.

The results of tables B5 and B6 confirm the impact of the Program on the measure of sociability - in all specifications the results are positive and significant, indicating that Educar contributes to a greater sociability of its participants. For other measures, the results are as strong. The Locus of Control, Imaginative, and Assertiveness variables present positive and significant results in some specifications, but in general it does not appear that the results are robust. For the variable Volatility, as in the first specification, the results suggest that there is no impact.

In terms of magnitude, according to the data in Table 2.2, the mean of the Sociability variable for the pre-intervention treaties was 3.127 - this means that an impact of 0.396 (according to the results in Table 5 - control group 2) represents 12% of the value of the variable in the baseline. The same rationale for the Assertiveness variable implies a 16% impact of the value of the variable at the baseline (mean before treatment was 2.92 with impact of 0.463). For the variable of interest in participating in the country's policy, the impact is quite large: impact of 42 percentage points. At the baseline 47% of the students said they had an interest in participating in the country's politics; due to the participation in Projeto Educar Project, in the end, 90% of the students said they are interested in participating in the country's politics.

2.6 Final considerations

The objective of this study was to present an impact assessment of the project Academia Educar of Educar DPaschoal Foundation, specifically the final results of the impact assessment on aspects related to socioemotional skills of students. Two field surveys were carried out to carry out the evaluation. A first cadastral survey of each student in early 2016; and a second survey at the end of the same year. The two surveys collected the impact indicators of interest, related to socioemotional characteristics.

The evaluation was based on the treaties that participated in the program in 2016. The control group chosen was formed by students who did not participate in the Academia Educar project. There are two distinct groups of controls, the first group is made up of students from two partner schools of the DPaschoal Foundation, but one of the schools has young people participating in the project. The second control group is formed only by young people from the school that is not participating in the program. The hypothesis of identification for the causal evaluation of the Academia Educar program on socioemotional indicators and political participation utilizes the observed pre-treatment variables as well as the method of differences in differences to deal with unobserved variables that are fixed in time.

The results of this evaluation should be read with all the necessary caution when we think that we do not have the perfect instruments to measure social skills, as well as when we remember that we did not have a lot to define the treaties, but rather a selection process that seeks to choose the most motivated / interested to participate.

We use different impact indicators associated with the socioemotional skills of the project beneficiaries. According to the results obtained, the program has a positive and statistically significant impact on Sociability and Political Participation. For assertiveness we also defend that there is an impact. The results obtained for this variable in proposal 1 are positive and significant for all specifications that use the combination of matching and differences in differences. Therefore, we conclude that this variable also has an impact. The results for Locus Control and Imaginative variables were significant and in the correct direction in part of the specifications; for Volatility, the results do not suggest impact.

It is important to emphasize, the evaluation relied on baseline data and with several robustness exercises, which leaves us more confident in terms of the credibility of the results. One suggestion would be to accompany the students, so that long-term effects

could be measured and it would be possible to know the effectiveness of the Academia Educar, that is, the duration of the impact.

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APPENDIX B - Propensity-score estimation, pairing balancing analysis, and additional results

Table B1: Probability of being treated - marginal effects for a medium-sized individual

Variables	Locus of control	Sociability	Assertiveness	Volatility	Imaginative	Political Part.
Locus of control	0.110 [0.328]	0.021 [0.841]	-0.094 [0.044]	0.022 [0.717]	-0.105 [0.137]	0.072 [0.377]
Boy	-0.110 [0.351]	-0.168 [0.114]	-0.190 [0.026]	-0.134 [0.190]	-0.153 [0.133]	-0.174 [0.030]
Age	-0.632 [0.000]	-0.688 [0.000]	-0.548 [0.000]	-0.627 [0.000]	-0.668 [0.000]	-0.544 [0.000]
Cognitive Skill	0.526 [0.000]	0.589 [0.000]	0.527 [0.000]	0.538 [0.000]	0.547 [0.000]	0.473 [0.000]
Sch. of the Father - High School.	0.285 [0.231]	0.249 [0.309]	0.291 [0.152]	0.198 [0.365]	0.309 [0.175]	0.243 [0.187]
Sch. of the Mother - High School	0.049 [0.793]	0.117 [0.566]	0.111 [0.494]	0.159 [0.391]	0.054 [0.764]	0.134 [0.375]
9º Year	0.007 [0.975]	0.128 [0.622]	0.137 [0.443]	0.201 [0.393]	0.044 [0.852]	0.155 [0.375]
1st Year of H. S.	0.411 [0.035]	0.459 [0.016]	0.462 [0.005]	0.545 [0.002]	0.445 [0.014]	0.514 [0.001]
Higher Income R $ 3,000.00	-0.236 [0.018]	-0.315 [0.000]	-0.261 [0.000]	-0.292 [0.000]	-0.263 [0.002]	-0.212 [0.002]
Books More than 3	0.045 [0.673]	0.060 [0.592]	0.072 [0.407]	0.090 [0.391]	0.083 [0.443]	0.031 [0.699]
Access to Cultural Goods 2	0.022 [0.880]	-0.059 [0.708]	-0.039 [0.737]	-0.032 [0.823]	-0.027 [0.847]	0.028 [0.801]
Access to Cultural Goods 3	0.067 [0.664]	0.028 [0.859]	-0.045 [0.695]	-0.021 [0.880]	0.073 [0.623]	-0.033 [0.773]
N Obs	137	133	189	160	149	208
LR Chi2(k)	79.38	86.60	113.43	97.27	94.49	119.64
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pseudo R2	0.4341	0.4865	0.4572	0.4553	0.4766	0.4418

Source: Academia Educar. Note: Blue enhancement - marginal effects are statistically different from zero with up to 95% confidence. Value in brackets is the P-Value.

Table B2: Balanced Quality - kernel matching, with common support

	Before Matching			After Matching		
	Treated	**Control**	**P-value**	**Treated**	**Control**	**P-value**
Student Variables	**Locus of control**					
Locus of control	2.358	2.416	0.30	2.505	2.426	0.36
Boy	0.358	0.469	0.05	0.372	0.460	0.40
Age	14.47	15.17	0.00	14.698	14.724	0.81
Cognitive Skill	0.650	0.115	0.00	0.325	0.439	0.28
Sch. of the Father - High School.	0.245	0.097	0.00	0.209	0.118	0.25
Sch. of the Mother - High School	0.283	0.106	0.00	0.255	0.133	0.15
9º Year	0.433	0.415	0.75	0.325	0.335	0.92
1st Year of H. S.	0.509	0.546	0.50	0.604	0.624	0.84
Higher Income R $ 3,000.00	0.075	0.142	0.09	0.069	0.042	0.58
Books More than 3	0.518	0.407	0.05	0.395	0.519	0.25
Access to Cultural Goods 2	0.566	0.486	0.17	0.465	0.499	0.75
Access to Cultural Goods 3	0.377	0.318	0.29	0.395	0.362	0.75
Student Variables	**Sociability**					
Sociability	3.395	3.320	0.26	3.196	3.277	0.43
Boy	0.326	0.458	0.02	0.333	0.367	0.74
Age	14.62	15.171	0.00	14.690	14.643	0.68
Cognitive Skill	0.682	0.114	0.00	0.357	0.445	0.41
Sch. of the Father - High School.	0.288	0.091	0.00	0.261	0.090	0.03
Sch. of the Mother - High School	0.326	0.119	0.00	0.309	0.104	0.02
9º Year	0.442	0.403	0.51	0.333	0.375	0.69
1st Year of H. S.	0.500	0.559	0.31	0.595	0.562	0.76
Higher Income R $ 3,000.00	0.057	0.148	0.02	0.047	0.026	0.61
Books More than 3	0.519	0.417	0.08	0.404	0.491	0.42
Access to Cultural Goods 2	0.567	0.458	0.06	0.500	0.548	0.65
Access to Cultural Goods 3	0.384	0.316	0.22	0.380	0.333	0.65
Student Variables	**Assertiveness**					
Assertiveness	3.271	3.045	0.02	2.953	2.970	0.91
Boy	0.347	0.506	0.00	0.351	0.362	0.91
Age	14.406	15.077	0.00	14.556	14.618	0.57
Cognitive Skill	0.666	0.103	0.00	0.314	0.418	0.27
Sch. of the Father - High School.	0.275	0.100	0.00	0.185	0.121	0.35
Sch. of the Mother - High School	0.333	0.11	0.00	0.240	0.131	0.14
9º Year	0.521	0.431	0.07	0.444	0.474	0.75
1st Year of H. S.	0.434	0.506	0.16	0.500	0.494	0.95
Higher Income R $ 3,000.00	0.057	0.183	0.00	0.055	0.038	0.67
Books More than 3	0.543	0.400	0.00	0.444	0.503	0.54
Access to Cultural Goods 2	0.550	0.426	0.08	0.555	0.504	0.59
Access to Cultural Goods 3	0.391	0.318	0.13	0.314	0.349	0.70

Source: Academia Educar. Note: Blue highlight - mean differences are statistically different from zero with up to 95% confidence.

Table B3: Balancing Quality - kernel matching, with common support

	Before Matching			After Matching		
	Treated	**Control**	**P-value**	**Treated**	**Control**	**P-value**
Student Variables			**Volatility**			
Volatility	3.274	3.261	0.88	3.113	2.995	0.56
Boy	0.354	0.488	0.01	0.363	0.533	0.11
Age	14.435	15.150	0.00	14.682	14.681	0.99
Cognitive Skill	0.661	0.114	0.00	0.295	0.330	0.72
Sch. of the Father - High School.	0.290	0.106	0.00	0.181	0.183	0.98
Sch. of the Mother - High School	0.338	0.114	0.00	0.250	0.210	0.66
9º Year	0.483	0.419	0.23	0.363	0.409	0.66
1st Year of H. S.	0.483	0.541	0.28	0.590	0.560	0.77
Higher Income R $ 3,000.00	0.064	0.183	0.00	0.068	0.044	0.63
Books More than 3	0.556	0.419	0.01	0.409	0.478	0.51
Access to Cultural Goods 2	0.556	0.465	0.09	0.500	0.529	0.78
Access to Cultural Goods 3	0.387	0.301	0.09	0.363	0.359	0.96
Student Variables			**Imaginative**			
Imaginative	3.375	3.204	0.04	3.163	3.122	0.80
Boy	0.350	0.516	0.00	0.350	0.435	0.39
Age	14.474	15.197	0.00	14.674	14.615	0.60
Cognitive Skill	0.666	0.114	0.00	0.304	0.399	0.34
Sch. of the Father - High School.	0.280	0.090	0.00	0.260	0.098	0.04
Sch. of the Mother - High School	0.315	0.131	0.00	0.304	0.119	0.30
9º Year	0.438	0.393	0.41	0.447	0.442	0.35
1st Year of H. S.	0.508	0.573	0.25	0.586	0.527	0.56
Higher Income R $ 3,000.00	0.070	0.173	0.01	0.065	0.038	0.56
Books More than 3	0.517	0.405	0.04	0.434	0.463	0.78
Access to Cultural Goods 2	0.570	0.454	0.04	0.478	0.534	0.59
Access to Cultural Goods 3	0.377	0.327	0.36	0.391	0.342	0.63
Student Variables			**Political Participation**			
Political Participation	0.700	0.378	0.00	0.464	0.544	0.24
Boy	0.360	0.525	0.00	0.339	0.512	0.06
Age	14.44	15.057	0.00	14.643	14.524	0.25
Cognitive Skill	0.673	0.122	0.00	0.321	0.320	0.99
Sch. of the Father - High School.	0.280	0.106	0.00	0.232	0.205	0.73
Sch. of the Mother - High School	0.346	0.145	0.00	0.285	0.234	0.54
9º Year	0.493	0.446	0.33	0.392	0.542	0.11
1st Year of H. S.	0.466	0.486	0.69	0.553	0.425	0.17
Higher Income R $ 3,000.00	0.066	0.201	0.00	0.071	0.04	0.57
Books More than 3	0.536	0.405	0.00	0.446	0.512	0.48
Access to Cultural Goods 2	0.580	0.466	0.02	0.535	0.411	0.19
Access to Cultural Goods 3	0.366	0.301	0.15	0.321	0.397	0.40

Source: Academia Educar. Note: Blue highlight - mean differences are statistically different from zero with up to 95% confidence.

Table B4: Results with other propensity score algorithms (proposal 1)

Method	Variables	(1) Locus of control	(2) Sociability	(3) Assertiveness	(4) Volatility	(5) Imaginative	(6) Part. Pol.
			Control Group 1				
1 neig. with rep	Impact	-0.275	0.581***	0.828**	0.162	0.591*	0.470***
		(0.237)	(0.177)	(0.329)	(0.364)	(0.340)	0.148
obs		120	114	148	126	120	164
2 neig. with rep	Impact	-0.351	0.390**	0.754***	-0.151	0.184	0.450***
		(0.203)	(0.200)	(0.285)	(0.304)	(0.300)	0.144
obs		142	132	182	148	144	198
			Control Group 2				
1 neig. with rep	Impact	-0.184	0.698***	0.578*	0.224	0.504	0.496***
		(0.233)	(0.183)	(0.317)	(0.375)	(0.363)	(0.145)
obs		116	106	142	120	114	154
2 neig. with rep	Impact	-0.278	0.400*	0.604***	-0.215	0.258	0.428***
		(0.204)	(0.213)	(0.280)	(0.299)	(0.315)	(0.139)
obs		134	124	170	140	136	182

Source: Own elaboration based on data from Academia Educar 2016. * 90%, ** 95% and *** 99% confidence.

Table B5: Results with other propensity score algorithms (proposal 2)

Method	Variables	(1) Loc. de cont.	(2) Sociability	(3) Assertiveness	(4) Volatility	(5) Imaginative
			Control Group 1			
Kernel	Impact	-0.440***	0.325**	0.122	0.302*	0.250*
		(0.071)	(0.148)	(0.094)	(0.175)	(0.133)
Obs		352	394	362	336	338
1 neig. with rep	Impact	-0.225	0.537***	-0.128	0.001	0.273
		(0.238)	(0.152)	(0.183)	(0.307)	(0.300)
Obs		120	110	120	116	118
2 neig. w with rep	Impact	-0.322*	0.367**	-0.068	0.067	-0.113
		(0.198)	(0.161)	(0.166)	(0.274)	(0.261)
Obs		142	126	152	136	144
			Control Group 2			
Kernel	Impact	-0.431***	0.328**	0.099	0.253	0.266*
		(0.147)	(0.154)	(0.096)	(0.182)	(0.139)
obs		320	350	326	310	308
1 neig. with rep	Impact	-0.116	0.611***	-0.183	-0.057	0.268
		(0.229)	(0.154)	(0.193)	(0.300)	(0.306)
obs		116	106	114	114	114
2 neig. with rep	Impact	-0.233	0.367**	-0.197	0.082	-0.031
		(0.195)	(0.161)	(0.181)	(0.272)	(0.266)
obs		134	126	140	132	136

Source: Own elaboration based on data from Academia Educar 2016. * 90%, ** 95% and *** 99% confidence.

Table BA: Questionnaire applied by Academia Educar

1. Nome:
2. Nome da Escola:
3. Série
4. Data de nascimento:
5. RG:
6. CPF:
7. Telefone Res.:
8. Celular:
9. Nome mãe:
10. Tel. Mãe:
11. Nome pai:
12. Tel. Pai:
13. Tel. Emergência:
14. Grau de parentesco:
15. E-mail:
16. Facebook:
17. Endereço:
18. CEP:
19. Está participando ou já participou de um projeto social ou curso extracurricular durante o seu período escolar, fora a Academia Educar? ( ) Não ( ) Sim Qual?_____
20. Você trabalha ou já trabalhou? (Marque apenas uma resposta) ( ) Sim | ( ) Não
21. Renda familiar: ( ) de R$0,00 a de R$1.085,00 ( ) de R$1.085,00 a R$1.734,00 ( ) de R$1.734,01 a R$3.000,00 ( ) de R$ 3.000,01 a R$ 5.500,00 ( ) de R$ 5.001,00 a R$ 7.475,00 ( ) de R$7.475,00 a R$9.745,00 ( ) Acima de R$9.745,00
22. Incluindo você, quantas pessoas moram na sua casa?
23. Qual é o nível de escolaridade do seu pai? (Marque apenas uma resposta) ( ) Da 1ª à 4ª série do Ensino Fundamental I (antigo primário) ( ) Da 5ª à 8ª série do Ensino Fundamental II (antigo ginásio) ( ) Ensino Médio (antigo 2º grau) ( ) Ensino Superior ( ) Especialização ( ) Não estudou ( ) Não sei
24. Qual é o nível de escolaridade da sua mãe? (Marque apenas uma resposta) ( ) Da 1ª à 4ª série do Ensino Fundamental (antigo primário) ( ) Da 5ª à 8ª série do Ensino Fundamental (antigo ginásio) ( ) Ensino Médio (antigo 2º grau) ( ) Ensino Superior ( ) Especialização ( ) Não estudou ( ) Não sei

25. Tem computador em casa com acesso à internet (Marque apenas uma resposta)
( ) Sim | ( ) Não

26. Seus pais ou responsáveis incentivam seus estudos?
( ) Sim | ( ) Não

27. Você tem apoio para conquistar os seus sonhos? Pode marcar mais que uma alternativa.
( ) Familiares ( ) Amigos ( ) Professores

28. Sua mãe trabalha?
( ) Sim | ( ) Não
Se sim, qual profissão? _____

29. Seu pai trabalha?
( ) Sim | ( ) Não
Se sim, qual profissão? _____

Parte 2 - Questionário aplicado no início da Edição <u>Academia Educar - 2016</u>

Nome:_____
Escola:_____

Resolva os desafios de lógica a seguir:

a) Por conta de um telefonema anônimo, a polícia invadiu uma casa para prender um suposto assassino. Mas ninguém sabia como ele era. Apenas que seu nome era John. Lá dentro, a polícia encontrou malabarista, boia-fria, ambientalista, analista de sistema e dentista. Sem ao menos perguntar seu nome, imediatamente, prendeu o dentista. Como os policiais souberam que prenderam a pessoa certa?

_____
_____
_____

b) Três copos estão com suco de laranja. Os outros três estão vazios.

Mexendo apenas 1 copo, você pode fazer, alternadamente, um copo ficar cheio e um vazio nesta sequência?

_____
_____
_____

Testes de gramática:

3. Complete as lacunas com MAS e MAIS:

a) Gosto muito de chocolate, _____ estou em dieta.
b) Quanto _____ estudo _____ aprendo, _____ se não estudo vou mal na prova.
c) Quero namorar, _____ minha mãe não deixa.
d) O amigo que _____ gosto está doente, _____ isso não me impedirá de ir à festa hoje a noite.

4. Passe as frases para o plural:

a) Tenho um amigo que é muito bom em futebol.

_____
_____
_____

b) Estava distraído comendo um pão e acabei tropeçando no degrau.

_____
_____
_____

Abaixo estão algumas questões que vão nos ajudar a saber mais sobre você.
Não existem respostas certas ou erradas.
Por favor, responda com a maior sinceridade possível.

5. Sobre seus sonhos:

a) Você tem um sonho:

( ) Sim Qual? _____

( ) Não

b) Você acredita que pode realizá-lo?

( ) Sim e já sei como realizá-lo.

( ) Sim, mas não sei como realizá-lo.

( ) Não

Por quê?

_____
_____
_____

c) A realização do seu sonho depende de quem?

_____
_____

6. Quais são os seus planos para os próximos 3 anos:

a) Estudar (Escola Técnica, Universidade/Faculdade)
b) Ir direto para o mercado de trabalho e adiar os estudos
c) Ir para o mercado de trabalho e fazer um curso noturno ao mesmo tempo
d) Empreender o meu próprio negócio
e) Não tenho planos

7. Com que frequência acessa bens culturais (teatro e/ou cinema e/ou museus, etc.):

( ) nunca
( ) uma ou duas vezes por ano
( ) três a seis vezes por ano
( ) mensalmente

8. Você acredita que deve participar da política em seu país? Justifique.

( ) Não ( ) Sim

_____
_____
_____

9. Lê quantos livros por ano?

10. Assinale com um X a resposta escolhida. Escolha apenas uma alternativa.

Avalie na escala abaixo quanto você consegue:	**1 Nada**	**2 Pouco**	**3 Mais ou menos**	**4 Muito**	**5 Totalmente**
1. Se tornar amigo(a) de outras pessoas.	□	□	□	□	□
2. Manter a atenção em atividades que demoram alguns meses para terminar.	□	□	□	□	□
3. Controlar os sentimentos.	□	□	□	□	□
4. Permanecer amigo(a) de outras pessoas.	□	□	□	□	□
5. Bater um papo com uma pessoa desconhecida.	□	□	□	□	□
6. Evitar pensamentos ruins.	□	□	□	□	□
7. Contar a um amigo que não se sente bem.	□	□	□	□	□
8. Dizer a outras pessoas da sua idade que eles estão fazendo algo que você gosta.	□	□	□	□	□
9. Fazer as tarefas bem e sem desperdício de tempo.	□	□	□	□	□
10. Não desviar a atenção com facilidade.	□	□	□	□	□
11. Contagiar os outros com meu entusiasmo.	□	□	□	□	□

Abaixo, mostramos algumas características pessoais que podem ou não ter a ver com você. Para responder às perguntas, pense em como você é/se sente/se comporta na maioria das situações.	**1** **Nada** Não tem nada a ver com a pessoa	**2** **Pouco** Tem um pouco a ver com a pessoa	**3** **Mais ou menos** Às vezes tem, às vezes não tem a ver com a pessoa	**4** **Muito** Tem muito a ver com a pessoa	**5** **Totalmente** Tem tudo a ver com a pessoa
26. De maneira geral, estou satisfeito(a) comigo mesmo(a).	□	□	□	□	□
27. Costumo perder a paciência.	□	□	□	□	□
28. Sinto que a melhor maneira de lidar com os problemas é apenas não pensar neles.	□	□	□	□	□
29. Acredito que sou reconhecido(a) como mereço na vida.	□	□	□	□	□
30. As pessoas nunca vão gostar de mim, não importa o que eu faça.	□	□	□	□	□
31. Sou meio desleixado(a), não tenho cuidado na hora de fazer as coisas.	□	□	□	□	□
32. Sinto que muitas vezes não vale a pena me esforçar porque, de qualquer modo, as coisas nunca dão certo mesmo.	□	□	□	□	□
33. Quando faço alguma coisa errada, sinto que existe muito pouco que posso fazer para consertar.	□	□	□	□	□
34. Quando alguém da minha idade não gosta de mim, acredito que há pouco o que fazer para mudar a situação .	□	□	□	□	□
35. Eu sou calmo(a) e controlo bem o meu estress.	□	□	□	□	□

Abaixo, mostramos algumas características pessoais que podem ou não ter a ver com você. Para responder às perguntas, pense em como você é/se sente/se comporta na maioria das situações.	**1 Nada** Não tem nada a ver com a pessoa	**2 Pouco** Tem um pouco a ver com a pessoa	**3 Mais ou menos** Às vezes tem, às vezes não tem a ver com a pessoa	**4 Muito** Tem muito a ver com a pessoa	**5 Totalmente** Tem tudo a ver com a pessoa
36. Novas ideias e novos projetos desviam minha atenção dos anteriores.	□	□	□	□	□
37. Pessoas boas nos esportes já nasceram assim.	□	□	□	□	□
38. Costumo ser quieto(a).	□	□	□	□	□
39. Acredito que posso mudar o que acontecerá comigo amanhã pelo que faço hoje.	□	□	□	□	□
40. Tenho muitas dúvidas se sou competente.	□	□	□	□	□
41. Sou reservado(a), fico mais na minha.	□	□	□	□	□
42. Sinto que tenho pouca influência sobre os acontecimentos da minha vida.	□	□	□	□	□
43. Consigo inventar coisas novas para passar o tempo.	□	□	□	□	□
44. Gosto de conversar.	□	□	□	□	□
45. Gostaria muito de viajar e conhecer o estilo de vida de outros povos.	□	□	□	□	□
46. Sou tímido(a), inibido(a).	□	□	□	□	□
47. Gosto da companhia das pessoas.	□	□	□	□	□

Abaixo, mostramos algumas características pessoais que podem ou não ter a ver com você. Para responder às perguntas, pense em como você é/se sente/se comporta na maioria das situações.	**1** **Nada** Não tem nada a ver com a pessoa	**2** **Pouco** Tem um pouco a ver com a pessoa	**3** **Mais ou menos** Às vezes tem, às vezes não tem a ver com a pessoa	**4** **Muito** Tem muito a ver com a pessoa	**5** **Totalmente** Tem tudo a ver com a pessoa
48. Brigo com os outros e acabo conseguindo com que eles façam o que eu quero .					
49. Gosto mais de estar entre os adultos do que entre colegas.					

4 FINAL CONSIDERATIONS

This thesis is composed by two articles in Applied Microeconomics - Economics of Education.

The first chapter I measured the effect of bullying in math scores of students in the 6th grade of public school in the city of Recife, Pernambuco, Brazil with the use of data from a survey by Joaquim Nabuco Foundation in 2013. The methodology used is Propensity Score Matching (PSM) in order to compare students who reported having suffered bullying with a control group, consisting of students who did not suffer bullying. Specifically, I aim to understand the role of social emotional skills and their potential influence on bullying. The results suggest that bullying has a negative impact on performance in mathematics and that social emotional skills can help students deal with bullying. Several econometric techniques were used to circumvent endogeneity problems. To identify personality traits, we use a factor model that also serves to correct for prediction error bias. The sensitivity analysis indicated potential problems of omitted variables. The results indicate that anti-bullying programs should take into account social emotional skills.

This study highlights the importance of new research involving the influence of the network of friendships in the classroom. An unprecedented factor in the Fundaj database for Brazil is the information regarding the student's network of friends within the classroom. This network of friendships was explored by Raposo (2015), with the aim of identifying peer influences on individual school performance. The authors identify a positive and significant effect of direct friend’s school performance on individual school outcomes. New studies that seek to explore the network of friendship of students involving bullying can contribute to this theme.

In the second chapter, I discuss that there are scarce but relevant researches stating the importance of educating socioemotional competencies to the youth as it impacts individual’s success in life, and what is even more scarce is the analysis of the results and impact of programs that work towards that educational goal, either implemented though public policies and Government funded projects. The objective of this study was to present an impact assessment of the project Academia Educar of Educar DPaschoal Foundation, specifically the final results of the impact assessment on aspects related to socioemotional skills of students. Two field surveys were carried out to carry out the

evaluation. A first cadastral survey of each student in early 2016; and a second survey at the end of the same year. The two surveys collected the impact indicators of interest, related to socioemotional characteristics. Using the methods of Propensity Score Matching and Differences in Differences. Positive and significant effects were found on Sociability (12% of initial value), Assertiveness (16% of initial value) and Political Participation (double the initial percentage of treaties interested in participating in the country's policy). The results for Locus Control and Imaginative variables were significant and in the direction expected only in part of the specifications; for Volatility, the results do not suggest impact. Several robustness analyzes were performed to validate the results found.

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APPENDIX A - The information used to create the scores of the non-cognitive abilities and the variable presence of the responsible

Conscientiousness

Do you like going to school? Do you do math homework? How often do you study the school subjects? When you have a test do you usually study only the day before the test? Do you read comic books or story books? Will I finish high school? I'm going to college

Extroversion

I am a popular person, I have many friends? Is the student physically attractive? Does the student have an attractive personality (is he charismatic)? Is the student extremely shy?

Emotional Stability

Do you feel left out in your classroom? I like myself the way I am? Would I change something physical in myself? Would I change anything in my personality? Am I trying to lose (gain) weight? Would I change my family if I could? I would like to study in a different school

Presence of the person in charge

Are you on the school board? This year, have you talked to a school teacher about how the student [speaking name] is going? Do you check the student's report card? If the student [name] gets a good grade, do you usually praise?

APPENDIX B - Propensity-score estimation, pairing balancing analysis, and additional results

Table B1: Probability of being treated - marginal effects for a medium-sized individual

Variables	Locus of control	Sociability	Assertiveness	Volatility	Imaginative	Political Part.
Locus of control	0.110 [0.328]	0.021 [0.841]	-0.094 [0.044]	0.022 [0.717]	-0.105 [0.137]	0.072 [0.377]
Boy	-0.110 [0.351]	-0.168 [0.114]	-0.190 [0.026]	-0.134 [0.190]	-0.153 [0.133]	-0.174 [0.030]
Age	-0.632 [0.000]	-0.688 [0.000]	-0.548 [0.000]	-0.627 [0.000]	-0.668 [0.000]	-0.544 [0.000]
Cognitive Skill	0.526 [0.000]	0.589 [0.000]	0.527 [0.000]	0.538 [0.000]	0.547 [0.000]	0.473 [0.000]
Sch. of the Father - High School.	0.285 [0.231]	0.249 [0.309]	0.291 [0.152]	0.198 [0.365]	0.309 [0.175]	0.243 [0.187]
Sch. of the Mother - High School	0.049 [0.793]	0.117 [0.566]	0.111 [0.494]	0.159 [0.391]	0.054 [0.764]	0.134 [0.375]
9º Year	0.007 [0.975]	0.128 [0.622]	0.137 [0.443]	0.201 [0.393]	0.044 [0.852]	0.155 [0.375]
1st Year of H. S.	0.411 [0.035]	0.459 [0.016]	0.462 [0.005]	0.545 [0.002]	0.445 [0.014]	0.514 [0.001]
Higher Income R $ 3,000.00	-0.236 [0.018]	-0.315 [0.000]	-0.261 [0.000]	-0.292 [0.000]	-0.263 [0.002]	-0.212 [0.002]
Books More than 3	0.045 [0.673]	0.060 [0.592]	0.072 [0.407]	0.090 [0.391]	0.083 [0.443]	0.031 [0.699]
Access to Cultural Goods 2	0.022 [0.880]	-0.059 [0.708]	-0.039 [0.737]	-0.032 [0.823]	-0.027 [0.847]	0.028 [0.801]
Access to Cultural Goods 3	0.067 [0.664]	0.028 [0.859]	-0.045 [0.695]	-0.021 [0.880]	0.073 [0.623]	-0.033 [0.773]
N Obs	137	133	189	160	149	208
LR Chi2(k)	79.38	86.60	113.43	97.27	94.49	119.64
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pseudo R2	0.4341	0.4865	0.4572	0.4553	0.4766	0.4418

Source: Academia Educar. Note: Blue enhancement - marginal effects are statistically different from zero with up to 95% confidence. Value in brackets is the P-Value.

Table B2: Balanced Quality - kernel matching, with common support

	Before Matching			After Matching		
	Treated	**Control**	**P-value**	**Treated**	**Control**	**P-value**
Student Variables			**Locus of control**			
Locus of control	2.358	2.416	0.30	2.505	2.426	0.36
Boy	0.358	0.469	0.05	0.372	0.460	0.40
Age	14.47	15.17	0.00	14.698	14.724	0.81
Cognitive Skill	0.650	0.115	0.00	0.325	0.439	0.28
Sch. of the Father - High School.	0.245	0.097	0.00	0.209	0.118	0.25
Sch. of the Mother - High School	0.283	0.106	0.00	0.255	0.133	0.15
9º Year	0.433	0.415	0.75	0.325	0.335	0.92
1st Year of H. S.	0.509	0.546	0.50	0.604	0.624	0.84
Higher Income R $ 3,000.00	0.075	0.142	0.09	0.069	0.042	0.58
Books More than 3	0.518	0.407	0.05	0.395	0.519	0.25
Access to Cultural Goods 2	0.566	0.486	0.17	0.465	0.499	0.75
Access to Cultural Goods 3	0.377	0.318	0.29	0.395	0.362	0.75
Student Variables			**Sociability**			
Sociability	3.395	3.320	0.26	3.196	3.277	0.43
Boy	0.326	0.458	0.02	0.333	0.367	0.74
Age	14.62	15.171	0.00	14.690	14.643	0.68
Cognitive Skill	0.682	0.114	0.00	0.357	0.445	0.41
Sch. of the Father - High School.	0.288	0.091	0.00	0.261	0.090	0.03
Sch. of the Mother - High School	0.326	0.119	0.00	0.309	0.104	0.02
9º Year	0.442	0.403	0.51	0.333	0.375	0.69
1st Year of H. S.	0.500	0.559	0.31	0.595	0.562	0.76
Higher Income R $ 3,000.00	0.057	0.148	0.02	0.047	0.026	0.61
Books More than 3	0.519	0.417	0.08	0.404	0.491	0.42
Access to Cultural Goods 2	0.567	0.458	0.06	0.500	0.548	0.65
Access to Cultural Goods 3	0.384	0.316	0.22	0.380	0.333	0.65
Student Variables			**Assertiveness**			
Assertiveness	3.271	3.045	0.02	2.953	2.970	0.91
Boy	0.347	0.506	0.00	0.351	0.362	0.91
Age	14.406	15.077	0.00	14.556	14.618	0.57
Cognitive Skill	0.666	0.103	0.00	0.314	0.418	0.27
Sch. of the Father - High School.	0.275	0.100	0.00	0.185	0.121	0.35
Sch. of the Mother - High School	0.333	0.11	0.00	0.240	0.131	0.14
9º Year	0.521	0.431	0.07	0.444	0.474	0.75
1st Year of H. S.	0.434	0.506	0.16	0.500	0.494	0.95
Higher Income R $ 3,000.00	0.057	0.183	0.00	0.055	0.038	0.67
Books More than 3	0.543	0.400	0.00	0.444	0.503	0.54
Access to Cultural Goods 2	0.550	0.426	0.08	0.555	0.504	0.59
Access to Cultural Goods 3	0.391	0.318	0.13	0.314	0.349	0.70

Source: Academia Educar. Note: Blue highlight - mean differences are statistically different from zero with up to 95% confidence.

Table B3: Balancing Quality - kernel matching, with common support

	Before Matching			After Matching		
	Treated	**Control**	**P-value**	**Treated**	**Control**	**P-value**
Student Variables			**Volatility**			
Volatility	3.274	3.261	0.88	3.113	2.995	0.56
Boy	0.354	0.488	0.01	0.363	0.533	0.11
Age	14.435	15.150	0.00	14.682	14.681	0.99
Cognitive Skill	0.661	0.114	0.00	0.295	0.330	0.72
Sch. of the Father - High School.	0.290	0.106	0.00	0.181	0.183	0.98
Sch. of the Mother - High School	0.338	0.114	0.00	0.250	0.210	0.66
9º Year	0.483	0.419	0.23	0.363	0.409	0.66
1st Year of H. S.	0.483	0.541	0.28	0.590	0.560	0.77
Higher Income R $ 3,000.00	0.064	0.183	0.00	0.068	0.044	0.63
Books More than 3	0.556	0.419	0.01	0.409	0.478	0.51
Access to Cultural Goods 2	0.556	0.465	0.09	0.500	0.529	0.78
Access to Cultural Goods 3	0.387	0.301	0.09	0.363	0.359	0.96
Student Variables			**Imaginative**			
Imaginative	3.375	3.204	0.04	3.163	3.122	0.80
Boy	0.350	0.516	0.00	0.350	0.435	0.39
Age	14.474	15.197	0.00	14.674	14.615	0.60
Cognitive Skill	0.666	0.114	0.00	0.304	0.399	0.34
Sch. of the Father - High School.	0.280	0.090	0.00	0.260	0.098	0.04
Sch. of the Mother - High School	0.315	0.131	0.00	0.304	0.119	0.30
9º Year	0.438	0.393	0.41	0.447	0.442	0.35
1st Year of H. S.	0.508	0.573	0.25	0.586	0.527	0.56
Higher Income R $ 3,000.00	0.070	0.173	0.01	0.065	0.038	0.56
Books More than 3	0.517	0.405	0.04	0.434	0.463	0.78
Access to Cultural Goods 2	0.570	0.454	0.04	0.478	0.534	0.59
Access to Cultural Goods 3	0.377	0.327	0.36	0.391	0.342	0.63
Student Variables			**Political Participation**			
Political Participation	0.700	0.378	0.00	0.464	0.544	0.24
Boy	0.360	0.525	0.00	0.339	0.512	0.06
Age	14.44	15.057	0.00	14.643	14.524	0.25
Cognitive Skill	0.673	0.122	0.00	0.321	0.320	0.99
Sch. of the Father - High School.	0.280	0.106	0.00	0.232	0.205	0.73
Sch. of the Mother - High School	0.346	0.145	0.00	0.285	0.234	0.54
9º Year	0.493	0.446	0.33	0.392	0.542	0.11
1st Year of H. S.	0.466	0.486	0.69	0.553	0.425	0.17
Higher Income R $ 3,000.00	0.066	0.201	0.00	0.071	0.04	0.57
Books More than 3	0.536	0.405	0.00	0.446	0.512	0.48
Access to Cultural Goods 2	0.580	0.466	0.02	0.535	0.411	0.19
Access to Cultural Goods 3	0.366	0.301	0.15	0.321	0.397	0.40

Source: Academia Educar. Note: Blue highlight - mean differences are statistically different from zero with up to 95% confidence.

Table B4: Results with other propensity score algorithms (proposal 1)

Method	Variables	(1) Locus of control	(2) Sociability	(3) Assertiveness	(4) Volatility	(5) Imaginative	(6) Part. Pol.
			Control Group 1				
1 neig. with rep	Impact	-0.275	0.581***	0.828**	0.162	0.591*	0.470***
		(0.237)	(0.177)	(0.329)	(0.364)	(0.340)	0.148
obs		120	114	148	126	120	164
2 neig. with rep	Impact	-0.351	0.390**	0.754***	-0.151	0.184	0.450***
		(0.203)	(0.200)	(0.285)	(0.304)	(0.300)	0.144
obs		142	132	182	148	144	198
			Control Group 2				
1 neig. with rep	Impact	-0.184	0.698***	0.578*	0.224	0.504	0.496***
		(0.233)	(0.183)	(0.317)	(0.375)	(0.363)	(0.145)
obs		116	106	142	120	114	154
2 neig. with rep	Impact	-0.278	0.400*	0.604***	-0.215	0.258	0.428***
		(0.204)	(0.213)	(0.280)	(0.299)	(0.315)	(0.139)
obs		134	124	170	140	136	182

Source: Own elaboration based on data from Academia Educar 2016. * 90%, ** 95% and *** 99% confidence.

Table B5: Results with other propensity score algorithms (proposal 2)

Method	Variables	(1) Loc. de cont.	(2) Sociability	(3) Assertiveness	(4) Volatility	(5) Imaginative
			Control Group 1			
Kernel	Impact	-0.440***	0.325**	0.122	0.302*	0.250*
		(0.071)	(0.148)	(0.094)	(0.175)	(0.133)
Obs		352	394	362	336	338
1 neig. with rep	Impact	-0.225	0.537***	-0.128	0.001	0.273
		(0.238)	(0.152)	(0.183)	(0.307)	(0.300)
Obs		120	110	120	116	118
2 neig. w with rep	Impact	-0.322*	0.367**	-0.068	0.067	-0.113
		(0.198)	(0.161)	(0.166)	(0.274)	(0.261)
Obs		142	126	152	136	144
			Control Group 2			
Kernel	Impact	-0.431***	0.328**	0.099	0.253	0.266*
		(0.147)	(0.154)	(0.096)	(0.182)	(0.139)
obs		320	350	326	310	308
1 neig. with rep	Impact	-0.116	0.611***	-0.183	-0.057	0.268
		(0.229)	(0.154)	(0.193)	(0.300)	(0.306)
obs		116	106	114	114	114
2 neig. with rep	Impact	-0.233	0.367**	-0.197	0.082	-0.031
		(0.195)	(0.161)	(0.181)	(0.272)	(0.266)
obs		134	126	140	132	136

Source: Own elaboration based on data from Academia Educar 2016. * 90%, ** 95% and *** 99% confidence.

Table BA: Questionnaire applied by Academia Educar

1. Nome:
2. Nome da Escola:
3. Série
4. Data de nascimento:
5. RG:
6. CPF:
7. Telefone Res.:
8. Celular:
9. Nome mãe:
10. Tel. Mãe:
11. Nome pai:
12. Tel. Pai:
13. Tel. Emergência:
14. Grau de parentesco:
15. E-mail:
16. Facebook:
17. Endereço:
18. CEP:
19. Está participando ou já participou de um projeto social ou curso extracurricular durante o seu período escolar, fora a Academia Educar? ( ) Não ( ) Sim Qual?_____
20. Você trabalha ou já trabalhou? (Marque apenas uma resposta) ( ) Sim | ( ) Não
21. Renda familiar: ( ) de R$0,00 a de R$1.085,00 ( ) de R$1.085,00 a R$1.734,00 ( ) de R$1.734,01 a R$3.000,00 ( ) de R$ 3.000,01 a R$ 5.500,00 ( ) de R$ 5.001,00 a R$ 7.475,00 ( ) de R$7.475,00 a R$9.745,00 ( ) Acima de R$9.745,00
22. Incluindo você, quantas pessoas moram na sua casa?
23. Qual é o nível de escolaridade do seu pai? (Marque apenas uma resposta) ( ) Da 1ª à 4ª série do Ensino Fundamental I (antigo primário) ( ) Da 5ª à 8ª série do Ensino Fundamental II (antigo ginásio) ( ) Ensino Médio (antigo 2º grau) ( ) Ensino Superior ( ) Especialização ( ) Não estudou ( ) Não sei
24. Qual é o nível de escolaridade da sua mãe? (Marque apenas uma resposta) ( ) Da 1ª à 4ª série do Ensino Fundamental (antigo primário) ( ) Da 5ª à 8ª série do Ensino Fundamental (antigo ginásio) ( ) Ensino Médio (antigo 2º grau) ( ) Ensino Superior ( ) Especialização ( ) Não estudou ( ) Não sei

25. Tem computador em casa com acesso à internet (Marque apenas uma resposta)
( ) Sim | ( ) Não

26. Seus pais ou responsáveis incentivam seus estudos?
( ) Sim | ( ) Não

27. Você tem apoio para conquistar os seus sonhos? Pode marcar mais que uma alternativa.
( ) Familiares ( ) Amigos ( ) Professores

28. Sua mãe trabalha?
( ) Sim | ( ) Não
Se sim, qual profissão? _____

29. Seu pai trabalha?
( ) Sim | ( ) Não
Se sim, qual profissão? _____

Parte 2 - Questionário aplicado no início da Edição <u>Academia Educar - 2016</u>

Nome:_____
Escola:_____

Resolva os desafios de lógica a seguir:

c) Por conta de um telefonema anônimo, a polícia invadiu uma casa para prender um suposto assassino. Mas ninguém sabia como ele era. Apenas que seu nome era John. Lá dentro, a polícia encontrou malabarista, boia-fria, ambientalista, analista de sistema e dentista. Sem ao menos perguntar seu nome, imediatamente, prendeu o dentista. Como os policiais souberam que prenderam a pessoa certa?

_____
_____
_____

d) Três copos estão com suco de laranja. Os outros três estão vazios.

Mexendo apenas 1 copo, você pode fazer, alternadamente, um copo ficar cheio e um vazio nesta sequência?

_____
_____
_____

Testes de gramática:

3. Complete as lacunas com MAS e MAIS:

e) Gosto muito de chocolate, _____ estou em dieta.
f) Quanto _____ estudo _____ aprendo, _____ se não estudo vou mal na prova.
g) Quero namorar, _____ minha mãe não deixa.
h) O amigo que _____ gosto está doente, _____ isso não me impedirá de ir à festa hoje a noite.

4. Passe as frases para o plural:

b) Tenho um amigo que é muito bom em futebol.

_____
_____
_____

b) Estava distraído comendo um pão e acabei tropeçando no degrau.

_____
_____
_____

Abaixo estão algumas questões que vão nos ajudar a saber mais sobre você.
Não existem respostas certas ou erradas.
Por favor, responda com a maior sinceridade possível.

5. Sobre seus sonhos:

d) Você tem um sonho:

( ) Sim Qual? _____

( ) Não

e) Você acredita que pode realizá-lo?

( ) Sim e já sei como realizá-lo.

( ) Sim, mas não sei como realizá-lo.

( ) Não

Por quê?

_____
_____
_____

f) A realização do seu sonho depende de quem?

_____
_____

6. Quais são os seus planos para os próximos 3 anos:

f) Estudar (Escola Técnica, Universidade/Faculdade)
g) Ir direto para o mercado de trabalho e adiar os estudos
h) Ir para o mercado de trabalho e fazer um curso noturno ao mesmo tempo
i) Empreender o meu próprio negócio
j) Não tenho planos

7. Com que frequência acessa bens culturais (teatro e/ou cinema e/ou museus, etc.):

( ) nunca
( ) uma ou duas vezes por ano
( ) três a seis vezes por ano
( ) mensalmente

8. Você acredita que deve participar da política em seu país? Justifique.

( ) Não ( ) Sim

_____
_____
_____

9. Lê quantos livros por ano?

10. Assinale com um X a resposta escolhida. Escolha apenas uma alternativa.

Avalie na escala abaixo quanto você consegue:	**1 Nada**	**2 Pouco**	**3 Mais ou menos**	**4 Muito**	**5 Totalmente**
1. Se tornar amigo(a) de outras pessoas.	□	□	□	□	□
2. Manter a atenção em atividades que demoram alguns meses para terminar.	□	□	□	□	□
3. Controlar os sentimentos.	□	□	□	□	□
4. Permanecer amigo(a) de outras pessoas.	□	□	□	□	□
5. Bater um papo com uma pessoa desconhecida.	□	□	□	□	□
6. Evitar pensamentos ruins.	□	□	□	□	□
7. Contar a um amigo que não se sente bem.	□	□	□	□	□
8. Dizer a outras pessoas da sua idade que eles estão fazendo algo que você gosta.	□	□	□	□	□
9. Fazer as tarefas bem e sem desperdício de tempo.	□	□	□	□	□
10. Não desviar a atenção com facilidade.	□	□	□	□	□
11. Contagiar os outros com meu entusiasmo.	□	□	□	□	□

Abaixo, mostramos algumas características pessoais que podem ou não ter a ver com você. Para responder às perguntas, pense em como você é/se sente/se comporta na maioria das situações.	**1 Nada** Não tem nada a ver com a pessoa	**2 Pouco** Tem um pouco a ver com a pessoa	**3 Mais ou menos** Às vezes tem, às vezes não tem a ver com a pessoa	**4 Muito** Tem muito a ver com a pessoa	**5 Totalmente** Tem tudo a ver com a pessoa
26. De maneira geral, estou satisfeito(a) comigo mesmo(a).	□	□	□	□	□
27. Costumo perder a paciência.	□	□	□	□	□
28. Sinto que a melhor maneira de lidar com os problemas é apenas não pensar neles.	□	□	□	□	□
29. Acredito que sou reconhecido(a) como mereço na vida.	□	□	□	□	□
30. As pessoas nunca vão gostar de mim, não importa o que eu faça.	□	□	□	□	□
31. Sou meio desleixado(a), não tenho cuidado na hora de fazer as coisas.	□	□	□	□	□
32. Sinto que muitas vezes não vale a pena me esforçar porque, de qualquer modo, as coisas nunca dão certo mesmo.	□	□	□	□	□
33. Quando faço alguma coisa errada, sinto que existe muito pouco que posso fazer para consertar.	□	□	□	□	□
34. Quando alguém da minha idade não gosta de mim, acredito que há pouco o que fazer para mudar a situação .	□	□	□	□	□
35. Eu sou calmo(a) e controlo bem o meu estress.	□	□	□	□	□

Abaixo, mostramos algumas características pessoais que podem ou não ter a ver com você. Para responder às perguntas, pense em como você é/se sente/se comporta na maioria das situações.	**1 Nada** Não tem nada a ver com a pessoa	**2 Pouco** Tem um pouco a ver com a pessoa	**3 Mais ou menos** Às vezes tem, às vezes não tem a ver com a pessoa	**4 Muito** Tem muito a ver com a pessoa	**5 Totalmente** Tem tudo a ver com a pessoa
36. Novas ideias e novos projetos desviam minha atenção dos anteriores.	□	□	□	□	□
37. Pessoas boas nos esportes já nasceram assim.	□	□	□	□	□
38. Costumo ser quieto(a).	□	□	□	□	□
39. Acredito que posso mudar o que acontecerá comigo amanhã pelo que faço hoje.	□	□	□	□	□
40. Tenho muitas dúvidas se sou competente.	□	□	□	□	□
41. Sou reservado(a), fico mais na minha.	□	□	□	□	□
42. Sinto que tenho pouca influência sobre os acontecimentos da minha vida.	□	□	□	□	□
43. Consigo inventar coisas novas para passar o tempo.	□	□	□	□	□
44. Gosto de conversar.	□	□	□	□	□
45. Gostaria muito de viajar e conhecer o estilo de vida de outros povos.	□	□	□	□	□
46. Sou tímido(a), inibido(a).	□	□	□	□	□
47. Gosto da companhia das pessoas.	□	□	□	□	□

Abaixo, mostramos algumas características pessoais que podem ou não ter a ver com você. Para responder às perguntas, pense em como você é/se sente/se comporta na maioria das situações.	**1** **Nada** Não tem nada a ver com a pessoa	**2** **Pouco** Tem um pouco a ver com a pessoa	**3** **Mais ou menos** Às vezes tem, às vezes não tem a ver com a pessoa	**4** **Muito** Tem muito a ver com a pessoa	**5** **Totalmente** Tem tudo a ver com a pessoa
48. Brigo com os outros e acabo conseguindo com que eles façam o que eu quero .					
49. Gosto mais de estar entre os adultos do que entre colegas.					