THE EFFECT OF BEING A VICTIM AND THE PRESENCE OF A BULLY IN CLASS ON STUDENTS' PERFORMANCE AT SCHOOL: EVIDENCE FROM UKRAINE

by

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A thesis submitted in partial fulfillment of
the requirements for the degree of

MA in Economic Analysis

Kyiv School of Economics

2012

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Abstract

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High students' achievement at school is very important nowadays since it is important for the later career of students and can explain wage inequality. One of the most important factors which determine studying is healthy environment at school. This paper considers the effect of being victimized and the presence of a bully in class on fourth and eighth students' performance at school. Data used in the research comes from Trends in International Mathematics and Science Study 2007 for Ukraine. We find that being a victim has a negative impact on students' performance at school for both fourth and eighth grades. Furthermore, it is found that violence behavior in a group which has at least one student who plays computer games too much negatively affects other students in the group for eighth grade.

TABLE OF CONTENTS

LIST OF TABLES

Number *Page*

ACKNOWLEDGMENTS

I would like to express my sincere gratitude to my thesis advisor, Professor Olena Nizalova, for her encouragement and guidance in the process of working on this research, for her inexhaustible patience to reread and correct my thesis over and over again, and for her deep knowledge of the material. I will feel everlasting gratitude for fascinating course of Labor Economics, instructed by Olena Nizalova, which not only broadened my horizon in the sphere of Labor economics and gave me all the necessary knowledge and skills for writing this thesis, but also inspired me to write my thesis on this particular topic.

Special words of gratitude are to all my thesis workshop instructors for their comments, and to Professor Volodymyr Vakhitov for his invaluable help in Stata.

Also, I would like to say thank you to Oleksandra Slobodian for her help and sound advice.

GLOSSARY

TIMSS. Trends in International Mathematics and Science Study

ILN. Interactive Learning Network

Chapter 1

INTRODUCTION

It is a well-known fact that students' good performance at school is very important, even for the later career of students. For example, math results can explain wage inequalities. Indeed, Grogger (1996) in his paper shows that high performance at mathematics can explain a great deal of wage inequality including black/white wage gap. This is just one reason why policy makers and schools are playing significant attention to high school performance.

There are a lot of different factors which determine students' achievement at school. The objective of this research paper is to examine the impact of being a victim and the presence of a bully in class on student performance at schools in Ukraine, and whether this effect is exacerbated or mitigated by playing computer games. The hypothesis is that being suppressed by other students negatively influences student's performance is investigated using mathematics and science test results.

One of the most important factors for improving students' learning is considered to be a safe and healthy environment in school (Hymel, 2006). Establishing proper discipline practices is vital for creating a safe learning environment (Luiselli, 2005). Bullying and peer victimization are examples of disruptive behavior which hampers in acquiring the necessary knowledge at school. Bullying has been found to pose the greatest threat for good academic performance of students (Konishi, 2007). As the Center for the Study and Prevention of Violence (2001) reports "a student is bullied and victimized when he or she is exposed,

repeatedly and over time, to negative actions on the part of one or more other students". There exist direct and indirect types of bullying. Direct bullying can be physical (hitting, kicking, pushing, chocking) and verbal (name calling, threatening, taunting, malicious teasing, rumor spreading, slandering). Indirect bullying is social isolation, making faces, obscene gestures, etc. It is more than direct that those students' who are hurt by others are trying to miss classes in order to escape from being offended as Seeley et al. (2009) state. Such truants negatively affect students' grades. Moreover, DeSimone (2009) in his paper shows that students with depressed mood are less interested in activities connected with studying which lowers the chances of getting A grades and increases the probability of getting C grades. As a result of behavior problems in adolescence have a negative influence on employment outcomes since school behavior problems are related to high school graduation (Karakus, 2010).

There are different reasons for being bullied. The Center for the Study and Prevention of Violence (2001) states that there are individual (cautious, sensitive, insecure personality, physically weakness), family (overprotection by parents), peer (lack of close friends) and school (presence of aggressive students, lack of suppression during breaks) risk factors. Carter (2006) provides evidence that students with disabilities are bullied more often. Among a wide variety of factors which causes bullying Hymel (2005) points out that the most important factor is a positive attitude towards aggression and violence. Indeed, aggressive students are more prone to hurt others. Kim (2004) reports that most victims do not know why they are bullied. They are inclined to think that they are bullied because of lack of close friends, physically weakness; some say that they are victimized by their low school achievement and evilness of bullies. Kim (2002) defines bullying as a goal-oriented aggression. Moreover, he supports the statement that "bullies can be characterized by a high potential of general aggressiveness", which can be exacerbated by different factors. One of such factors is playing violent computer

games. Batholow (2002) showed that students who played violent computer games became more aggressive.

On the other hand, the introduction of new technologies to interactive learning and collaborative work can increase students' interest in studying and boost students' performance at school. Enriquez (2011) shows that traditional lecture format is more effective in a variety of areas of science and engineering education such as chemistry, physics, engineering and computer science, if supplemented by interactive methods. Vigdor (2010) states that a wide variety of initiatives has been undertaken to increase disadvantaged children's access to computer. Having a computer at home improves students' learning, especially in mathematics. However, it might have a negative effect on students' achievement since internet access and unlimited computer usage can distract student's mind leading to worse results in test scores. Furthermore, computer can have negative effects on students such as depression, aggressiveness, displacement of social activities and physical problems such as obesity and injuries to eyes, wrist and back (Bielefeldt, 2005), which in turn are negatively associated with labor market outcomes. For instance, Han et al. (2009) in their paper show a negative relationship between the body mass index and employment outcomes since employers have distaste for overweight and obese people. Also, Jolls et al. (2004) in their paper discuss the problem of disability discrimination and troubles in employment protection of such people.

The data comes from the Trends in International Mathematics and Science Study database which provides the information on Ukrainian students' and schools' background for 2007. A similar research has been done by Ammermuler (2006) using the same database for 11 countries not including Ukraine since the country was included in the database in 2007. He found that different countries have different results and that is why such research is necessary for Ukraine.

Furthermore, he did not control for computer games. But other literature shows that playing computer games can lead to aggression which causes bullying other students. On the other hand having a computer at home increases students' learning. Thus, not including these variables leads to omitted variable bias.

The methodology which is going to be used is ordinary least squares and school fixed effects regression.

This paper is structured in the following way: Chapter 2 gives a review of the literature about the impact of the factors that influence students' performance at school; Chapter 3 describes the methodology used in the research; Chapter 4 gives the data description; Chapter 5 outlines the estimation results and Chapter 6 concludes.

Chapter 2

LITERATURE REVIEW

This literature review provides information on the influence of the presence of the bully in class and being victimized on students' performance at school. We start by reviewing the theoretical literature, then, we focus on the empirical results from studies regarding the effect of bullying on students' achievement, factors which cause bullying, the influence of playing computer games on being aggressive, the impact of computer usage on students' tests results at school, and finally zoom in on similar studies for Ukraine.

2.1 Theoretical evidence

First of all, the Center for the Study and Prevention on Violence (2001) gives the theoretical arguments of where bullying comes from and the factors which determine bullying. It defines bullying as being repeatedly exposed to negative actions on the part of one or more other students. According to the study bullying is also characterized by aggressive behavior. The authors divide bullying on direct (physical and verbal) and indirect (social isolation, intentional exclusion, making faces, obscene gestures, manipulating friendship relationships). There are individual, family, peer and school risk factors for both bullying and being bullied. The main factors for bullying are positive attitude towards violence and physically aggressiveness. The main factors of being bullied are insecure personality and the presence of aggressive students.

Seeley et al. (2009) develop a theoretical model which explains the effect of peer victimization and bullying on academic performance and class attendance. The main scheme is that bullied students are missing classes in order to escape from

being offended. As a result of missing classes the students' grades are much lower since they do not know the material they missed. At the same time, being victimized also has a direct effect on students' performance at school since insulted students are not interested in activities such as studying hard. Both these factors have negative influence on students' achievement at school.

2.2 Empirical evidence

Existing empirical literature also examined this question. Ammermueller (2006) conducted a research using the TIMMS 2003 data for 11 European countries not including Ukraine. In his paper he analyzes violence in schools and the effects of it on students' performance. The measure for students' performance was mathematics and reading test scores of a student. The results show that the main factors of being a victim are gender, social and migration background, and appearance. He also finds a strong negative effect of being a victim on students' achievements at school. Then, the researcher adds school fixed effects in the regression, which only slightly changes of the results.

Lacey et al. (2011) demonstrate the effect of bullying and bullying climate on achievement in high schools of Virginia. The authors use data for students of the 9th to - 12th class grade. The victims are identified by asking students whether they were bullied, whereas the bullying climate was measured by scale which describes the extent of bullying at school. The achievements in Algebra, Earth Science and World History were chosen as independent variables. The results show negative effect on students' performance; moreover, the bullying climate does not correlate with student poverty, school size and the proportion of minority students in the school.

Juvoven et al. (2011) finds that bullying experiences are connected with lower academic performance of students of public middle schools in Los Angeles. The

authors use multilevel models (MLM) which show the link between peer victimization and academic performance. The first model examines the correlation between peer victimization and academic performance across three years, while the second model studies whether this effect is due to between-subject or within-subject differences in victimization over time. The results show the negative effect of victimization on GPA of students, controlling for demographic and school-level differences. Furthermore, the study suggests that peer victimization effect is due to between-subject differences.

Luiselli et al. (2005) studies the relationship between students' behavior at school and their performance. Unlike other papers, this study examines the implementation of the program which supports positive behavior at elementary school in urban areas. The program consisted of special training for teachers and administration, discipline referrals which were completed for students who misbehaved, making the student to remain out of school for several days, increasing classroom activity engagement and reinforcing positive performance. As a result of such intervention discipline problems decreased and students' performance increased significantly in reading and mathematics tests.

Speaking about the factors which determine aggression there is a paper by Batholow et al. (2002) which examines the effects of violent computer games on aggressive behavior. The researches use a sample of 43 undergraduate students which were to play violent computer game such as Mortal Kombat and not violent game such as PGA Tournament Golf. After playing the game students were asked to introduce a punishment for their opponent which served as measure of violence. The results show that students who played violent games appeared to be aggressive. Moreover, the results show that boys are more aggressive than girls.

Taking into account that computer usage also influences students' performance in mathematics, there is a line of papers examining this issue. Vigdor et al. (2010) studies the effect of having a computer at home and Internet access on students' achievement using the data for North Carolina. In their paper the authors use data on public school students in grades from 5 to 8. They use the presence of a personal computer at home, the access to high-speed internet and time spent using computer for studying to find the influence of computer usage on students' performance at school. The results of the paper show small but still statistically significant negative influence of having a computer at home on students' mathematics and reading test scores. Further, this research suggests that the introduction of a broad access to home computes and internet will result in greater achievements gap. However, the authors do not consider endogeneity which is potentially present in the model since they do not mention that access to computer can be restricted by parents.

Another paper written by Goolsbee at al. (2006) examined the impact of the introduction of Internet access in every school of California on students' achievement from 1996 to 2000. The aim of the program which provided Internet access was to invest in Internet by proving subsidies for spending on technology. The paper shows that the subsidies succeeded in increasing investment. However, the results of the paper showed no significant influence on a wide variety of test scores.

Quite controversial results have been obtained in the research by Enriquez (2011). The researcher in his paper investigates the influence of usage of tablet computers during classes on student learning. The paper describes two case studies each using Interactive Learning Network model. The first study compares Canada College Circuits courses, Spring 2006 class that used ILN model and Spring 2005 that used ordinary model. The second study compares two different groups:

Spring 2006 class of Canada College that used ILN and a class of San Diego State University that used traditional model. It appears that using wireless communication yielded a positive effect on students learning. Furthermore, the implementation of such changes in classroom interaction proved to have a statistically significant positive influence on students' achievement.

Li Xiaoming et al. (2006) performed a research examining the influence of computer usage on school readiness and cognitive development among head start children. Experimental group was allowed to use a computer 15-20 minutes a day, while the control group was given an ordinary Head Start curriculum. In 6 months time the test scores showed overwhelming results: performance of the experimental group was found to be significantly better which shows a positive effect of computer usage.

There have been not that much research carried out for Ukraine with regards to factors that determine students' performance at school. Tkhoryk (2011) investigates the impact of a school size on education performance in transition countries using TIMSS 2007. He finds that there is no strong impact of school size on students' achievement. In addition, he shows that the presence of disruptive students has negative effect on students' achievement. He also analyses other factors that may affect students' performance such as reading books for entertainment, playing computer games, playing with friends, etc. He finds that playing computer games more that four hours a day has negative impact on students' performance at school in the majority of the countries examined, Ukraine including.

This paper aims to examine the influence of being a victim and the presence of a bully on students' performance at school for Ukraine. Different countries have different upbringing methods and measures for controlling students' behavior,

and thus, give different results. Hence, the results obtained for Ukraine will contribute to the programs oriented to improve the students' behavior at schools.

Chapter 3

METHODOLOGY

The basic empirical hypothesis in this paper is to analyze the influence of being bullied on students' test scores at school. The econometric equation is taking the following form:

$$S_{ics} = \alpha_1 + \alpha_2 B_{ics} + \alpha_3 X_{ics} + \eta_s + \nu_{cs} + \varepsilon_{ics} \quad (1)$$

where S_{ics} - the average of test scores of student *i* in class *c* of school *s* (mathematics, physics and chemistry for eighth grade students and mathematics and science for fourth grade students)

B_{ics} - bulling related variables

X_{ics} - a vector of student characteristics

The first bullying variable is constructed in the following way: whether a student was hit or hurt by other students, whether something of a student was stolen (Ammermueller, 2006), whether a student was made to do things by other students, and whether a student was left out of activities (social isolation) within the prior month. Each of the items is a dummy variable, while the variable of being bullied is a sum of all insults (these dummy variables) to one student. Good students may be made fun of because some children are jealous of others success and one more variable is added to control for whether a student is made fun of or called names.

Student characteristics are divided into three groups: students' background, studying related factors and institutional factors. Student background consist of a gander, age, how often the student speaks the language of a test at home, whether

the parents of a student and student himself are immigrants (Angrist, 2002), highest education of parents (Behrman, 1999). Studying related factors are number of books at home, time spent doing homework, time spent playing sports, time spent watching TV, how often a student works in groups, access to a home computer, availability of high speed internet (Vigdor, 2010), time spent playing computer games, time spent reading books for enjoyment, time spent doing jobs at home and time spent with friends. Institutional factors are gender of a teacher teaching that particular course, teaching experience (Ammermueller, 2006) and its square, age of a teacher, highest educational level of a teacher, shortage of materials, total school enrollment, percentage of students coming from economically disadvantaged background, percentage of students coming from economically affluent background and age of a teacher.

The students' achievement at school also depends on family background characteristics such as parental education and household income. It is true since parents with higher household income invest more in their children education, and innate ability of parents influences innate ability of students. Behrman (1999) finds statistically significant effects of family background characteristics on students' performance at school. However, the only data available concerning family background is whether the parents of a student were born in country and years of education.

While trying to identify the causal effect of independent variables on dependant, there often arise problems such as omitted variable bias. One of such variables can be an innate ability of a student since student's achievements at mathematics (science) are mostly determined by student's ability (Chen, 2009). However, student's innate ability can never be measured perfectly, and the omission of this variable usually leads to upward bias on estimated effects of family background characteristics (Behrman, 1999). In order to control for students' ability a proxy

such as IQ level is usually used. However, such tests are imperfect proxies of innate ability of a student and can reduce the bias only to a certain extent. To deal with problem Chen (2009) suggests using cognitive development test which unfortunately has not been carried out for this data set.

There might be an endogeniety in the model that may arise is whether students are bullied for their poor performance at school. There are plenty of factors which can cause being victimized by others such as being a weak personality, having disabilities, the presence of aggressive students, low grades and others. However, there is no evidence that having poor achievements can be the only source of being bullied.

It is true that students' performance depends on the performance of their classmates. Manski (1993) states that behavior of one student in a group influences other students in the same group. Therefore, it is necessary to control for the presence of a bully in class since violent behavior to one student can affect other students. Moreover, this violent behavior can be caused by playing computer games which provokes aggression. That is why the following regression is estimated:

$$S_{ics} = \alpha_1 + \alpha_2 B_{ics} + \alpha_3 X_{ics} + \alpha_4 BP_{ics} C_{ics} + \eta_s + \nu_{cs} + \varepsilon_{ics} \quad (2)$$

where BP_{ics} is a bully presence variable, and C_{ics} is a dummy variable which equals one if at least one student in class plays computer games more than one hour a day.

Another problem that may create bias is the unobserved quality of a school. To control for school quality fixed effects approach is used in this paper. Thus, the basic econometric equation can be rewritten in the following form:

$$S_{ics} = \alpha_1 + \alpha_2 X_{ics} + \alpha_3 B_{ics} + \alpha_4 q_s + \eta_s + \nu_{cs} + \varepsilon_{ics}, \quad (3)$$

where q_s is the vector of school quality characteristics, which is constant across all students in school *s*.

There are 146 schools in the sample and only 184 classes. This means that the majority of schools in the sample have one class only. School fixed effects regression is used, however, the results depend on those 38 classes but on the whole sample.

Chapter 4

DATA DESCRIPTION

The data comes from the Trends in International Mathematics and Science Study 2007 (TIMSS 2007) which is a publicly available international database. TIMSS was created by the International Association for the Evaluation of Educational Achievement in order to compare students' educational performance across borders. The database contains students' performance data for the fourth and eighth grades, and student, teacher, school background for 67 countries. The TIMSS 2007 is used since Ukraine was included in the survey for the first time in 2007.

The sample of fourth grade students consists of 4292 observations (2101 girls and 2191 boys). Due to missing observations there are 3217 observations in the final regression (1639 girls and 1578 boys). Furthermore, there is no information about parental education for fourth grade students and no information about science teachers. Table 1 in the Appendix presents variables that explain students' production function of education, and Table 2 and Table 3 provide the descriptive statistics for all variables of fourth grade students for mathematics and science, correspondingly. The average achievements in mathematics and science are 491,32 and 493,85, respectfully. 73% of students speak the language of the test at home and 89% of students were born in country. There are 64% of students who have more than 26 books at home and only 48% of all students read books more than one hour a day for enjoyment. 47% of students reported that they have a computer at home and 27% answered that they play computer games more than one hour a day.

The sample of eighth grade students consists of 4424 observations (2294 girls and 2130 boys). Due to missing observations in the sample we have 3355 and 3405 observations in the final regression for mathematics and physics (chemistry), respectfully. Table 4 – Table 6 give the descriptive statistics for variables of eighth grade students. The average achievements in mathematics, physics and chemistry are 481,04; 506,64 and 503,63, correspondingly. 66% of all students in eighth grade speak the language of the test at home and 94% of students were born in country. There are 70% of students in the sample who have more than 26 books at home and only 36% of all students read books more than one hour a day for enjoyment. 55% of students have a computer at home and 39% of students play computer games more than four hours a day.

Chapter 5

EMPIRICAL RESULTS

As discussed in Chapter 3 the students' test scores in mathematics and science was regressed on the wide variety of variables which define the students' production function. The results of the estimation are presented in Table 7 – Table 11. All main variables appeared to have expected signs. The robustness check confirmed these results.

5.1 Fourth grade mathematics students

It is found that forth grade bullied students have worse achievement in mathematics. Further, the results show that the presence of a bully in classes, in which students play computer games more than one hour, has no significant impact on students' test scores. Also, it is found that students who study better in general are made fun of or called names since other students are jealous of good grades. Girls are found to score less in mathematics than boys. Having a lot of books and a computer at home, being born in country, the size of the school and reading books for enjoyment positively influence achievement in mathematics. In addition to that, it is found that watching TV and playing computer games has a negative impact on achievements in mathematics. Also, it was found that students who work in groups have lower grades.

5.2 Fourth grade science students

For the fourth grade science students, it is found that being a victim causes lower grades. Violent behavior in classes where students play computer games more that one hour a day does not have significant effect on students' performance. And good students are also made fun for their performance. Apart from this, it turned

out that girls are less able than boys in science. The important role in students' performance plays the fact of being not an immigrant, which shows positive effect on scores in science. Having a computer and plenty of books at home, the school size and reading books for enjoyment have significantly positive effect on students studying as well. However, it was discovered that students who work in groups have much lower test scores. Also, it did not come as a surprise that those students who spend more that one hour a day playing computer games, watching TV and have Internet access are not that good at studying.

5.3 Eighth grade mathematics students

The results of both OLS and FE regressions show that being victimized has much stronger negative effect on the performance at mathematics for eighth grade students that for fourth grade students. Furthermore, it proved that the presence of a bully in classes where students play computer games has a negative impact on students' achievement in mathematics, but fixed effects regression shows that it may be caused by school factors. However, better students are made fun of because of envy. It is also found that eighth grade girls are worse in mathematics than boys. An important role in mathematics test scores play such factors as having a lot of books, a calculator, a computer, doing home works and reading books for enjoyment, which show significant positive effect. Another important factor in students' achievement is the education level of both parents and being born in country. Further, the results show that playing computer games, watching TV and doing housework has negative influence on studying.

5.4 Eighth grade physics students

For eighth grade science students being bullied also has negative effect on test scores. The presence of a bully in classes where students play too much computer games has negative effect on performance at physics, which is again a school effect according to fixed effects regression. Students strong at physics also are

made fun of. Also, the results show that girls seem to score less than boys and the highest education level of a father has positive impact on test scores while mother's does not play a significant role. Factors which determine high achievement at physics are having plenty of books and a computer at home, reading for enjoyment and spending time on homework. Factors which have negative impact on studying physics are watching TV, playing computer games, working in groups and doing housework.

5.4 Eighth grade chemistry students

The results show that chemistry test scores are also affect by bullying, however, less than mathematics and physics for eighth grade students. Further, the presence of a bully in class has negative impact on studying chemistry in classes where at least one child plays computer games more than an hour per day, which also can be a school factor. Students good at chemistry are also made fun of. Speaking the language of a test at home, being born in country, having books, a computer and a calculator at home have positive effect on students performance at chemistry. Furthermore, watching TV, playing computer games and doing housework as expected has a negative influence on the achievement.

Chapter 2

CONCLUSIONS

In this thesis the effect of being a victim and the presence of a bully in class on students' performance at school is analyzed. To curry out this research TIMSS 2007 is used. The results are achieved using OLS and FE regressions for fourth grade students (mathematics and science) and for eighth grade students (mathematics, physics and chemistry).

The results show that being victimized has a negative impact on mathematics and science achievements at school for both fourth and eights grades students. Also, it is found that the presence of a bully in classes with children playing computer games too much has no effect on students' performance at school for fourth grade students; however, it has negative effect on all courses of eighth grade students. It is also found that having a computer, a lot of books at home, reading for enjoyment and being born in country has a positive impact on test scores in sciences and mathematics. However, watching TV and playing computer games has negative influence on both fourth and eighth grade students' test scores.

The results of this research can be used by policymakers in improving the quality of education in Ukraine.

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Table 1: Explanatory variables

Variable	Definition
Bullying related variables	
Bullied	A sum of all offences to a student (something of a student's possession was stolen, a student was hurt by others, a student was made do things by other students, a student was left out of activities)
MadeFun	A student was made fun of or called names (=1 if yes)
CompBully	The total number of all offences in one class times dummy variable which equals one if at least one child in class plays computer games more than one hour
Students' background	
Age	Age of a student
Girl	Sex of a student (=1 if girl)
SpeakLang	How often a student speaks the language of a test at home (=1 if always or almost always)
BornCountry	A student was born in country (=1 if yes)
ParentsBorn	Parents of a student were born in country.(= 1 if both parents born in country)
FatherEduc	Highest educational level of a father
MotherEduc	Highest educational level of a mother
Studying related factors	
Books	How many books a student has in his home (=1 if more than 26)
ReadBooks	How much time a student spends reading books for enjoyment (=1 if more than one hour)
Groups	How often a student works in groups (=1 if every or almost every lesson)
HomeWork	Time spent on doing home work(=1 if more than one hour)
Sports	How much time a student spends playing sports (=1 if more than one hour)
Housework	How much time a student spends do jobs at (=1 if more than one hour)
WithFriends	How much time a student spends playing or talking with friends (=1 if more than one hour)
WatchTV	How much time a student spends watching TV or videos (=1 if more than four hours)
CompGames	How much time a student spends playing computer games (=1 if more than one hour)
Calcul	A student has a calculator at home (=1 if has)

Table 1: Explanatory variables – Continued

Variable	Definition
Computer	A student has a computer at home (=1 if has)
Internet	A student has an Internet connection at home (=1 if has)
Institutional factors	
AgeTeacher	Age of a teacher. 1- under 25, 2 – from 25 to 29, 3 – from 30 to 39, 4 – from 40 to 49, 5 – from 50 to 59, 6 – over 60
TeacherFemale	Gender of a teacher (=1 if female)
YearsTeach	Teacher's experience in years
YearsTeachSq	Experience squared
TeachEduc	Highest educational level of a teacher
ShortMater	Shortage of instructional materials (=1 if a lot)
EconDisadv	Percentage of students from economically disadvantaged background
EconAffluent	Percentage of students from economically affluent background
SchoolEnroll	Total school enrollment

Table 2: Descriptive statistics for fourth grade mathematics students

Variable	Mean	Std.Dev.	Min	Max
Dependent variable				
Mathematics	491,32	72,53	218,71	705,54
Bullying related variables				
Bullied	0,6099	0,86488	0	4
MadeFun	25,58%		0	1
CompBully	14,4945	7,6762	0	39
Students' background				
Age	10,27	0,4591	8	13
Girl	50,95%		0	1
SpeakLang	72,83%		0	1
BornCountry	89,46%		0	1
ParentsBorn	76,16		0	1
Studying related factors				
Books	63,91%		0	1
ReadBooks	48,46%		0	1
Groups	44,02%		0	1
HomeWork	53,87%		0	1
Sports	49,89%		0	1
Housework	63,91%		0	1
WithFriends	74,32%		0	1
WatchTV	6,96%		0	1
CompGames	26,86%		0	1
Calcul	83,21%		0	1
Computer	47,28%		0	1
Internet	27,01%		0	1
Institutional factors				
AgeTeacher	3,8196	1,001	1	6
TeacherFemale	1	0	1	1
YearsTeach	22,589	8,8628	1	46
YearsTeachSq	588,7905	423,72	1	2116
TeachEduc	4,6944	0,7099	3	6
ShortMater	46,9%		0	1
EconDisadv	1,4168	0,7364	1	4
EconAffluent	2,9123	1,0676	1	4
SchoolEnroll	742,3311	330,3041	56	1553

Table 3: Descriptive statistics for fourth grade science students

Variable	Mean	Std.Dev.	Min	Max
Dependent variable				
Science	493,85	70,18	220,87	701,37
Bullying related variables				
Bullied	0,6099	0,86488	0	4
MadeFun	25,58%		0	1
BullyPresence	14,4945	7,6762	0	39
Students' background				
Age	10,27	0,4591	8	13
Girl	50,95%		0	1
SpeakLang	72,83%		0	1
BornCountry	89,46%		0	1
ParentsBorn	76,16%		0	1
Studying related factors				
Books	63,91%		0	1
ReadBooks	48,46%		0	1
Groups	44,02%		0	1
HomeWork	53,87%		0	1
Sports	49,89%		0	1
Housework	63,91%		0	1
WithFriends	74,32%		0	1
WatchTV	6,96%		0	1
CompGames	26,86%		0	1
Calcul	83,21%		0	1
Computer	47,28%		0	1
Internet	27,01%		0	1
Institutional factors				
ShortMater	46,9%		0	1
EconDisadv	1,4168	0,7364	1	4
EconAffluent	2,9123	1,0676	1	4
SchoolEnroll	742,3311	330,3041	56	1553

Table 4: Descriptive statistics for eighth grade mathematics students

Variable	Mean	Std.Dev.	Min	Max
Dependent variable				
Mathematics	481,04	79,29	213,98	745,68
Bullying related variables				
Bullied	0,3273	0,6667	0	4
MadeFun	13,92%		0	1
CompBully	8,559	4,824	0	27
Students' background				
Age	14,094	0,5096	11	17
Girl	53,11%		0	1
SpeakLang	66,2%		0	1
BornCountry	93,86%		0	1
ParentsBorn	77,56%		0	1
MothEduc	5,11	1,61	1	8
FathEduc	5,32	1,74	1	8
Studying related factors				
Books	69,72%		0	1
ReadBooks	35,83%		0	1
Groups	19,76%		0	1
HomeWork	83,58%		0	1
Sports	47,84%		0	1
Housework	65,07%		0	1
WithFriends	79,94%		0	1
WatchTV	10,88%		0	1
CompGames	38,75%		0	1
Calcul	98,45%		0	1
Computer	54,93%		0	1
Internet	25,1%		0	1
Institutional factors				
AgeTeacher	4,098	1,138	1	6
TeacherFemale	93,11%		0	1
YearsTeach	22,78	10,97	1	50
YearsTeachSq	639,59	523,72	1	2500
TeachEduc	5,0035	0,1794	3	6
ShortMater	53,23%		0	1
EconDisadv	1,4712	0,7852	1	4
EconAffluent	2,9296	1,0824	1	4
SchoolEnroll	688,8468	336,1316	56	1553

Table 5: Descriptive statistics for eighth grade physics students

Variable	Mean	Std.Dev.	Min	Max
Dependent variable				
Physics	506,64	71,76	232,04	744,77
Bullying related variables				
Bullied	0,3263	0,6648	0	4
MadeFun	14%		0	1
CompBully	8,559	4,792	0	27
Students' background				
Age	14,094	0,5083	11	17
Girl	53,01%		0	1
SpeakLang	66,46%		0	1
BornCountry	93,86%		0	1
ParentsBorn	77,62%		0	1
MothEduc	5,11	1,61	1	8
FathEduc	5,32	1,74	1	8
Studying related factors				
Books	69,84%		0	1
ReadBooks	36,12%		0	1
Groups	19,29%		0	1
HomeWork	83,76%		0	1
Sports	48,02%		0	1
Housework	65,17%		0	1
WithFriends	79,94%		0	1
WatchTV	10,75%		0	1
CompGames	38,77%		0	1
Calcul	98,41%		0	1
Computer	55,04%		0	1
Internet	25,29%		0	1
Institutional factors				
AgeTeacher	4,037	1,313	1	6
TeacherFemale	67,31%		0	1
YearsTeach	21,88	12,24	1	50
YearsTeachSq	628,69	607,41	1	2500
TeachEduc	5,011	0,3577	2	6
ShortMater	53,22%		0	1
EconDisadv	1,4725	0,7818	1	4
EconAffluent	2,9016	1,0931	1	4
SchoolEnroll	695,68	341,93	56	1553

Table 6: Descriptive statistics for eighth grade chemistry students

Variable	Mean	Std.Dev.	Min	Max
Dependent variable				
Chemistry	503,63	73,12	194,31	744,74
Bullying related variables				
Bullied	0,3263	0,6648	0	4
MadeFun	14%		0	1
CompBully	8,559	4,792	0	27
Students' background				
Age	14,094	0,5083	11	17
Girl	53,01%		0	1
SpeakLang	66,46%		0	1
BornCountry	93,86%		0	1
ParentsBorn	77,62%		0	1
MothEduc	5,11	1,61	1	8
FathEduc	5,32	1,74	1	8
Studying related factors				
Books	69,84%		0	1
ReadBooks	36,12%		0	1
Groups	19,29%		0	1
HomeWork	83,76%		0	1
Sports	48,02%		0	1
Housework	65,17%		0	1
WithFriends	79,94%		0	1
WatchTV	10,75%		0	1
CompGames	38,77%		0	1
Calcul	98,41%		0	1
Computer	55,04%		0	1
Internet	25,29%		0	1
Institutional factors				
AgeTeacher	4,037	1,313	1	6
TeacherFemale	67,31%		0	1
YearsTeach	21,88	12,24	1	50
YearsTeachSq	628,69	607,41	1	2500
TeachEduc	5,011	0,3577	2	6
ShortMater	53,22%		0	1
EconDisadv	1,4725	0,7818	1	4
EconAffluent	2,9016	1,0931	1	4
SchoolEnroll	695,68	341,93	56	1553

Table 7: Estimation results for fourth grade mathematics students

VARIABLES	(1) OLS Math	(2) FE Math	(3) OLS2 Math	(4) FE2 Math
Bullied	-6.761***	-5.681***	-6.163***	-5.682***
	(1.548)	(1.492)	(1.590)	(1.508)
MadeFun	5.669*	5.724*	5.856*	5.724*
	(3.094)	(2.952)	(3.095)	(2.952)
Girl	-11.78***	-12.40***	-11.62***	-12.41***
	(2.456)	(2.327)	(2.457)	(2.329)
SpeakLang	-9.451***	-6.530**	-9.308***	-6.530**
	(2.646)	(3.037)	(2.647)	(3.038)
Books	25.46***	21.03***	25.45***	21.03***
	(2.464)	(2.375)	(2.463)	(2.375)
Calcul	3.808	1.765	3.865	1.764
	(3.129)	(2.982)	(3.128)	(2.983)
Computer	20.26***	12.86***	20.55***	12.86***
	(2.734)	(2.651)	(2.739)	(2.652)
Internet	-4.925*	-7.553***	-5.038*	-7.553***
	(2.937)	(2.820)	(2.937)	(2.821)
Groups	-8.922***	-10.90***	-8.975***	-10.90***
	(2.334)	(2.273)	(2.334)	(2.275)
WatchTV	-21.01***	-17.90***	-20.92***	-17.90***
	(4.640)	(4.388)	(4.639)	(4.390)
CompGames	-12.57***	-9.238***	-12.57***	-9.238***
	(2.935)	(2.778)	(2.934)	(2.779)
WithFriends	29.38***	26.56***	29.46***	26.56***
	(2.726)	(2.617)	(2.726)	(2.622)
HouseWork	0.149	3.003	0.0268	3.003
	(2.559)	(2.457)	(2.560)	(2.458)
Sports	1.661	-2.163	1.627	-2.162
	(2.421)	(2.324)	(2.420)	(2.325)
ReadBooks	9.993***	10.04***	9.949***	10.04***
	(2.458)	(2.340)	(2.457)	(2.341)
HomeWork	1.964	-0.0767	2.167	-0.0769
	(2.368)	(2.279)	(2.370)	(2.279)
BornCountry	42.33***	41.35***	42.25***	41.35***
	(3.890)	(3.721)	(3.889)	(3.723)
Age	6.585***	5.092**	6.823***	5.091**
	(2.526)	(2.490)	(2.529)	(2.501)

Table 7: Estimation results for fourth grade mathematics students – Continued

VARIABLES	(1) OLS Math	(2) FE Math	(3) OLS2 Math	(4) FE2 Math
ParentsBorn	1.849	4.448	1.811	4.448
	(2.793)	(2.730)	(2.792)	(2.731)
AgeTeacher	-7.337**	-7.673	-7.201**	-7.674
	(2.979)	(5.246)	(2.980)	(5.253)
YearsTeach	0.316	1.232	0.286	1.231
	(0.681)	(1.252)	(0.681)	(1.260)
TeachEduc	5.765***	7.439**	5.808***	7.441**
	(1.709)	(3.128)	(1.709)	(3.144)
ShortMater	-4.782**	-704.2***	-5.489**	-704.3***
	(2.414)	(93.33)	(2.451)	(94.42)
YearsTaechSq	0.00991	-0.00183	0.00968	-0.00181
	(0.0115)	(0.0198)	(0.0115)	(0.0200)
EconDisadvan	-2.607	-430.7***	-2.145	-430.7***
	(1.731)	(55.02)	(1.753)	(55.42)
EconAffluen	-0.999	132.9***	-1.147	132.9***
	(1.168)	(20.45)	(1.171)	(20.67)
SchoolEnroll	0.0280***	0.495***	0.0291***	0.495***
	(0.00375)	(0.139)	(0.00381)	(0.139)
CompBully			-0.270	0.00189
			(0.165)	(0.313)
Constant	328.6***	1,113***	328.7***	1,113***
	(29.38)	(91.15)	(29.37)	(92.51)
Observations	3,217	3,217	3,217	3,217
R-squared	0.203	0.351	0.203	0.351

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

Table 8: Estimation results for fourth grade science students

VARIABLES	(1) OLS Science	(2) FE Science	(3) OLS2 Science	(4) FE2 Science
Bullied	-5.284***	-4.537***	-4.886***	-4.657***
	(1.499)	(1.468)	(1.540)	(1.484)
MadeFun	8.727***	8.989***	8.849***	8.986***
	(2.996)	(2.904)	(2.998)	(2.904)
Girl	-10.59***	-11.02***	-10.49***	-11.08***
	(2.378)	(2.290)	(2.380)	(2.293)
SpeakLang	-8.781***	-7.948***	-8.698***	-7.936***
	(2.542)	(2.978)	(2.543)	(2.979)
Books	25.57***	20.79***	25.56***	20.78***
	(2.384)	(2.335)	(2.384)	(2.336)
Calcul	2.231	0.167	2.276	0.123
	(3.024)	(2.929)	(3.024)	(2.930)
Computer	19.64***	13.64***	19.82***	13.62***
	(2.647)	(2.607)	(2.652)	(2.608)
Internet	-5.606**	-7.346***	-5.675**	-7.330***
	(2.845)	(2.775)	(2.845)	(2.775)
Groups	-6.609***	-7.869***	-6.646***	-7.826***
	(2.260)	(2.235)	(2.261)	(2.237)
WatchTV	-16.88***	-14.33***	-16.81***	-14.37***
	(4.490)	(4.318)	(4.490)	(4.319)
CompGames	-16.72***	-14.04***	-16.70***	-14.04***
	(2.841)	(2.734)	(2.841)	(2.735)
WithFriends	26.97***	24.71***	27.01***	24.62***
	(2.637)	(2.574)	(2.637)	(2.579)
HouseWork	2.133	4.217*	2.061	4.240*
	(2.473)	(2.414)	(2.474)	(2.414)
Sports	0.794	-1.791	0.778	-1.766
	(2.343)	(2.287)	(2.343)	(2.288)
ReadBooks	7.831***	8.712***	7.804***	8.733***
	(2.376)	(2.303)	(2.376)	(2.304)
HomeWork	0.0765	-1.936	0.199	-1.961
	(2.287)	(2.240)	(2.289)	(2.241)
BornCountry	48.64***	47.53***	48.59***	47.57***
	(3.763)	(3.663)	(3.763)	(3.664)
Age	9.795***	7.322***	9.951***	7.209***
	(2.444)	(2.448)	(2.448)	(2.457)

Table 8: Estimation results for fourth grade science students - Continued

VARIABLES	(1) OLS Science	(2) FE Science	(3) OLS2 Science	(4) FE2 Science
ParentsBorn	3.362	6.411**	3.324	6.434**
	(2.696)	(2.679)	(2.696)	(2.680)
ShortMater	-4.228*	-614.2***	-4.700**	-623.8***
	(2.312)	(89.15)	(2.350)	(90.86)
EconDisadvan	-2.622	-367.9***	-2.337	-372.8***
	(1.663)	(51.89)	(1.683)	(52.64)
EconAffluen	-0.309	116.6***	-0.419	118.5***
	(1.125)	(19.79)	(1.129)	(20.10)
SchoolEnroll	0.0235***	0.412***	0.0241***	0.418***
	(0.00356)	(0.130)	(0.00361)	(0.130)
CompBully			-0.177	0.166
			(0.158)	(0.301)
Constant	306.2***	1,011***	306.4***	1,020***
	(27.01)	(87.50)	(27.01)	(89.09)
Observations	3,217	3,217	3,217	3,217
R-squared	0.200	0.327	0.200	0.327

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

Table 9: Estimation results for eighth grade mathematics students

VARIABLES	(1) OLS Math	(2) FE Math	(3) OLS2 Math	(4) FE2 Math
Bullied	-11.75***	-9.868***	-9.965***	-9.732***
	(2.088)	(1.927)	(2.108)	(1.929)
MadeFun	16.05***	13.12***	16.56***	13.29***
	(3.999)	(3.687)	(3.985)	(3.688)
Girl	-8.325***	-8.926***	-8.244***	-8.953***
	(2.784)	(2.579)	(2.774)	(2.579)
SpeakLang	-0.500	4.485	0.954	4.456
	(2.678)	(3.374)	(2.682)	(3.374)
Books	28.57***	21.20***	28.70***	21.23***
	(2.815)	(2.645)	(2.804)	(2.644)
Calcul	26.43***	25.85***	26.62***	26.11***
	(9.977)	(9.292)	(9.939)	(9.292)
Computer	27.67***	20.80***	27.25***	20.77***
	(2.998)	(2.799)	(2.987)	(2.799)
Internet	3.709	-4.636	4.085	-4.726
	(3.172)	(2.967)	(3.161)	(2.968)
MothEduc	3.735***	2.826***	3.789***	2.814***
	(0.864)	(0.802)	(0.861)	(0.802)
FathEduc	2.458***	1.807**	2.438***	1.804**
	(0.787)	(0.727)	(0.784)	(0.727)
Groups	-13.54***	-17.28***	-14.20***	-17.10***
	(3.128)	(3.030)	(3.118)	(3.031)
WatchTV	-11.57***	-10.41***	-11.76***	-10.37***
	(4.066)	(3.765)	(4.050)	(3.764)
CompGames	-9.223***	-7.096***	-9.229***	-7.166***
	(2.946)	(2.729)	(2.934)	(2.729)
WithFriends	8.048**	8.380***	7.860**	8.379***
	(3.178)	(2.920)	(3.166)	(2.920)
HouseWork	-17.89***	-11.73***	-18.13***	-11.76***
	(2.725)	(2.527)	(2.715)	(2.526)
Sports	-4.871*	-7.196***	-4.716*	-7.189***
	(2.653)	(2.476)	(2.643)	(2.476)
ReadBooks	3.652	3.613	3.794	3.613
	(2.651)	(2.476)	(2.641)	(2.475)
HomeWork	24.10***	17.44***	22.83***	17.07***
	(3.494)	(3.252)	(3.490)	(3.261)

Table 9: Estimation results for eighth grade mathematics students – Continued

VARIABLES	(1) OLS Math	(2) FE Math	(3) OLS2 Math	(4) FE2 Math
BornCountry	50.92***	41.54***	50.31***	41.40***
	(5.274)	(4.938)	(5.255)	(4.938)
Age	-5.057**	-2.411	-5.080**	-2.444
	(2.478)	(2.505)	(2.469)	(2.505)
ParentsBorn	-7.852***	-3.915	-8.012***	-3.829
	(3.033)	(2.900)	(3.022)	(2.900)
AgeTeacher	2.784	-18.12*	3.020	-18.60*
	(2.736)	(10.02)	(2.726)	(10.03)
TeacherFemale	4.652	50.65***	0.901	44.74***
	(5.409)	(13.76)	(5.437)	(14.34)
YearsTeach	-0.00987	3.272**	0.316	3.497**
	(0.521)	(1.385)	(0.523)	(1.393)
TeachEduc	-1.178	-30.05	-2.236	-20.44
	(7.352)	(21.95)	(7.327)	(22.91)
ShortMater	-5.638**	19.03	-6.290**	5.240
	(2.557)	(109.2)	(2.550)	(109.6)
YearsTaechSq	-0.00773	-0.0371**	-0.0136	-0.0380**
	(0.00894)	(0.0175)	(0.00898)	(0.0175)
EconDisadvan	-5.472***	-52.84	-4.566**	-49.86
	(1.779)	(48.27)	(1.781)	(48.30)
EconAffluen	-1.751	-37.75	-2.006*	-30.11
	(1.207)	(35.30)	(1.203)	(35.68)
SchoolEnroll	0.00811**	0.300	0.0118***	0.285
	(0.00408)	(0.229)	(0.00413)	(0.229)
CompBully			-1.400***	-1.115
			(0.272)	(0.763)
Constant	422.3***	588.2***	436.0***	540.8***
	(54.90)	(132.1)	(54.76)	(136.0)
Observations	3,355	3,355	3,355	3,355
R-squared	0.209	0.388	0.215	0.388

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

Table 10: Estimation results for eighth grade physics students

VARIABLES	(1) OLS Physics	(2) FE Physics	(3) OLS2 Physics	(4) FE2 Physics
Bullied	-12.73***	-11.71***	-11.34***	-11.75***
	(1.889)	(1.783)	(1.911)	(1.788)
MadeFun	24.21***	22.08***	24.64***	22.06***
	(3.609)	(3.408)	(3.601)	(3.409)
Girl	-28.39***	-28.86***	-28.36***	-28.85***
	(2.516)	(2.380)	(2.510)	(2.381)
SpeakLang	3.299	9.807***	4.554*	9.786***
	(2.410)	(3.088)	(2.421)	(3.090)
Books	31.67***	26.35***	31.78***	26.35***
	(2.548)	(2.446)	(2.542)	(2.446)
Calcul	16.61*	14.53*	17.05*	14.48*
	(8.928)	(8.480)	(8.905)	(8.484)
Computer	19.73***	15.28***	19.24***	15.27***
	(2.713)	(2.589)	(2.708)	(2.589)
Internet	4.502	-0.891	4.780*	-0.880
	(2.869)	(2.739)	(2.862)	(2.740)
MothEduc	0.120	-0.491	0.189	-0.490
	(0.782)	(0.742)	(0.780)	(0.742)
FathEduc	2.257***	1.764***	2.222***	1.764***
	(0.712)	(0.673)	(0.711)	(0.673)
Groups	-7.419***	-10.92***	-8.075***	-10.93***
	(2.868)	(2.823)	(2.864)	(2.823)
WatchTV	-10.38***	-9.860***	-10.62***	-9.878***
	(3.706)	(3.505)	(3.696)	(3.506)
CompGames	-6.170**	-4.862*	-6.170**	-4.839*
	(2.664)	(2.517)	(2.657)	(2.519)
WithFriends	6.071**	6.473**	5.859**	6.484**
	(2.880)	(2.707)	(2.873)	(2.707)
HouseWork	-9.575***	-5.207**	-9.718***	-5.187**
	(2.470)	(2.341)	(2.463)	(2.342)
Sports	-2.876	-3.306	-2.791	-3.319
	(2.401)	(2.285)	(2.395)	(2.286)
ReadBooks	6.998***	7.196***	7.068***	7.202***
	(2.400)	(2.282)	(2.394)	(2.283)
HomeWork	27.33***	20.41***	26.37***	20.46***
	(3.184)	(3.027)	(3.184)	(3.033)

Table 10: Estimation results for eighth grade physics students – Continued

VARIABLES	(1) OLS Physics	(2) FE Physics	(3) OLS2 Physics	(4) FE2 Physics
BornCountry	49.84***	39.08***	49.14***	39.11***
	(4.767)	(4.573)	(4.758)	(4.575)
Age	-1.088	-1.460	-1.167	-1.451
	(2.239)	(2.320)	(2.234)	(2.321)
ParentsBorn	-7.679***	-6.462**	-7.760***	-6.461**
	(2.754)	(2.684)	(2.747)	(2.684)
AgeTeacher	0.448	-34.98	0.310	-36.27
	(2.593)	(22.08)	(2.587)	(22.57)
TeacherFemale	-7.341***	-125.0**	-7.715***	-125.5**
	(2.561)	(49.28)	(2.556)	(49.32)
YearsTeach	-0.185	4.284	-0.383	4.563
	(0.536)	(4.539)	(0.536)	(4.649)
TeachEduc	6.706**	-32.51	9.365***	-31.54
	(3.247)	(36.24)	(3.296)	(36.41)
ShortMater	-2.263	176.5	-2.444	173.1
	(2.318)	(160.3)	(2.312)	(160.8)
YearsTaechSq	-0.000127	0.000536	0.00484	-0.00277
	(0.00807)	(0.0572)	(0.00813)	(0.0584)
EconDisadvan	-1.333	-23.81	-0.688	-23.09
	(1.585)	(22.16)	(1.588)	(22.31)
EconAffluen	-1.626	-118.2***	-1.940*	-118.9***
	(1.119)	(42.84)	(1.118)	(42.91)
SchoolEnroll	0.00307	0.783*	0.00560	0.774*
	(0.00358)	(0.439)	(0.00362)	(0.440)
CompBully			-1.090***	0.175
			(0.252)	(0.628)
Constant	393.4***	578.8***	390.9***	581.9***
	(38.83)	(84.46)	(38.73)	(85.21)
Observations	3,405	3,405	3,405	3,405
R-squared	0.196	0.349	0.201	0.349

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

Table 11: Estimation results for eighth grade chemistry students

VARIABLES	(1) OLS Chemistry	(2) FE Chemistry	(3) OLS2 Chemistry	(4) FE2 Chemistry
Bullied	-9.364***	-8.446***	-7.959***	-8.434***
	(1.971)	(1.853)	(1.994)	(1.858)
MadeFun	15.15***	12.94***	15.58***	12.94***
	(3.765)	(3.542)	(3.757)	(3.543)
Girl	-8.329***	-9.179***	-8.294***	-9.181***
	(2.625)	(2.474)	(2.618)	(2.474)
SpeakLang	5.673**	7.054**	6.945***	7.061**
	(2.514)	(3.210)	(2.526)	(3.211)
Books	30.95***	24.87***	31.07***	24.87***
	(2.658)	(2.542)	(2.652)	(2.542)
Calcul	27.85***	26.28***	28.30***	26.29***
	(9.313)	(8.814)	(9.291)	(8.817)
Computer	15.34***	11.05***	14.85***	11.05***
	(2.830)	(2.691)	(2.825)	(2.691)
Internet	4.987*	-0.493	5.268*	-0.496
	(2.993)	(2.847)	(2.986)	(2.848)
MothEduc	3.352***	2.850***	3.421***	2.850***
	(0.815)	(0.771)	(0.813)	(0.771)
FathEduc	1.574**	1.038	1.538**	1.038
	(0.743)	(0.699)	(0.741)	(0.699)
Groups	-7.329**	-10.71***	-7.995***	-10.71***
	(2.991)	(2.934)	(2.988)	(2.934)
WatchTV	-12.05***	-10.50***	-12.29***	-10.50***
	(3.866)	(3.642)	(3.856)	(3.644)
CompGames	-7.549***	-6.844***	-7.550***	-6.851***
	(2.779)	(2.616)	(2.772)	(2.618)
WithFriends	13.02***	12.60***	12.81***	12.60***
	(3.004)	(2.813)	(2.997)	(2.814)
HouseWork	-10.70***	-6.720***	-10.84***	-6.727***
	(2.576)	(2.433)	(2.570)	(2.434)
Sports	-5.054**	-6.117**	-4.968**	-6.113**
	(2.505)	(2.375)	(2.499)	(2.376)
ReadBooks	5.367**	5.451**	5.438**	5.449**
	(2.504)	(2.372)	(2.498)	(2.373)
HomeWork	22.39***	16.84***	21.42***	16.83***
	(3.322)	(3.146)	(3.321)	(3.152)

Table 11: Estimation results for eighth grade chemistry students – Continued

VARIABLES	(1) OLS Chemistry	(2) FE Chemistry	(3) OLS2 Chemistry	(4) FE2 Chemistry
BornCountry	41.17***	31.41***	40.46***	31.40***
	(4.973)	(4.753)	(4.964)	(4.755)
Age	-0.0552	0.334	-0.136	0.331
	(2.336)	(2.412)	(2.330)	(2.412)
ParentsBorn	0.0192	3.119	-0.0633	3.119
	(2.873)	(2.789)	(2.866)	(2.790)
AgeTeacher	2.228	-31.21	2.088	-30.81
	(2.705)	(22.95)	(2.699)	(23.45)
TeacherFemale	-6.355**	-167.9***	-6.734**	-167.7***
	(2.672)	(51.22)	(2.667)	(51.26)
YearsTeach	-0.816	3.685	-1.017*	3.597
	(0.559)	(4.717)	(0.560)	(4.832)
TeachEduc	9.197***	-64.35*	11.89***	-64.65*
	(3.387)	(37.66)	(3.439)	(37.84)
ShortMater	-2.403	334.1**	-2.586	335.2**
	(2.417)	(166.6)	(2.412)	(167.1)
YearsTaechSq	0.00892	0.00464	0.0140	0.00567
	(0.00842)	(0.0594)	(0.00849)	(0.0607)
EconDisadvan	-3.554**	-38.13*	-2.901*	-38.36*
	(1.653)	(23.03)	(1.656)	(23.19)
EconAffluen	-0.840	-169.3***	-1.158	-169.1***
	(1.167)	(44.52)	(1.166)	(44.60)
SchoolEnroll	0.00469	1.300***	0.00725*	1.303***
	(0.00373)	(0.456)	(0.00377)	(0.457)
CompBully			-1.104***	-0.0549
			(0.262)	(0.653)
Constant	334.2***	481.0***	331.6***	480.0***
	(40.50)	(87.78)	(40.41)	(88.56)
Observations	3,405	3,405	3,405	3,405
R-squared	0.158	0.323	0.162	0.323

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