Does Academic Achievement Kill Recreational Reading?[°]

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ABSTRACT

Despite several studies have pointed out an empirical relationship between recreational reading and academic performance, however, the opposite issue of the impact of academic performances on recreational reading has been totally neglected by literature. The purpose of the paper is to fill in this lack by analyzing whether academic performance might someway reduce time for recreational reading. Using a control-function approach to control for endogenous covariates, we empirically analyze the responses to an on-line survey conducted among the students of the University of Bologna in the period May-July 2010 concerning students' reading and studying habits. Moreover, an extension of the Blinder-Oaxaca decomposition approach to nonlinear responses has been applied to decompose the differences in recreational reading between female and male students. The main findings show that, whereas the time and effort devoted to study reduces the time available for recreational reading, female students would read a higher number of books if they had the same academic performance of male students. In other words, idiosyncratic gender characteristics contribute to different attitude to recreational reading between female and male students.

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1. Introduction

As reading is crucial in almost every activity, and particularly in the accumulation of knowledge, a number of studies have analyzed how reading habits affects the academic performance of students (Bastug, 2014; Chotitham and Wongwanich, 2014; Gaddis S.M., 2013; Keskin, 2013; Thrupp, 2013; Jaeger, 2011; Wildhagen 2010; Wilms, 2010; Jaeger, 2009; Wildhagen, 2009; Meneghetti et al. 2006; Pretorius, 2002; Sulivan, 2001; Lazarus and Callahan, 2000). However, better performances at school require to devote more time to study and less time to recreational activities, reading among them.

Recreational reading, also referred to as leisure reading or independent reading, involves students' self-choice of reading on their own. Recreational reading constitutes a very personal choice, as reading comes from a large variety of sources, and choosing what, when and how one reads for own pleasure, does not involve any assignment of it, request of a report, or checks on comprehension (Cullinam, 2000).

The ability to read and comprehend a content is considered one of the basic conditions for success in life (Thrupp; 2013; Van den Broek & Espin, 2012). Children who read for pleasure are likely to do significantly better at school (Institute of Education, 2011), and later on, on the labor market (Brunello et al., 2012) than peers who are weak readers.

To the best of our knowledge, the issue of the impact of school and academic performances on recreational reading has been neglected by the literature. Although several surveys have shown that many primary and middle school students do not choose to read large quantities, nor do they choose to read often (Anderson, Fielding, and Wilson 1988; Morrow and Weinstein 1986; Greaney 1980), how academic performance impacts on recreational reading is still an open question. The purpose of this paper is to clarify this point.

Using a control-function approach to control for endogenous covariates, we empirically analyze the responses to an on-line survey conducted among the students of the University of Bologna in the period May-July 2010 concerning students' reading and studying habits. Moreover, an extension of the Blinder-Oaxaca decomposition approach to nonlinear responses has been applied to decompose the differences in recreational reading between female and male students. The main findings show that, whereas the time and effort devoted to study reduces the time available for recreational reading, female students would read a higher number of books if they had the

same academic performance of male students. In other words, idiosyncratic gender characteristics contribute to different attitude to recreational reading between female and male students.

2. Method

In this paper we analyze whether academic performance might someway reduce time for recreational reading, measured by the number of books that a student reports having read in the last year, *reading.* The idea is that better and frequent academic achievements, proxied by the average number of exams passed every year, *exams*, are more time consuming so to force students to have less time to dedicate to other activities, and in particular reading non-academic books.

Since *reading* and academic performance are likely jointly determined, we must control for endogeneity to avoid that a standard single-equation estimator results to be biased. In order to account for endogenous regressors, a control-function approach or structural-model technique (Cameron Trivedi, 2010) has been adopted.

We can assume that the mean of the dependent variable, *reading* (μ), depends on all the regressors, included the endogenous variable:

$$reading_i \sim count\ data(\mu_i)$$

$$\mu_i = E(reading | exams_i, x_i, u_i) = exp(\beta_y\ exams_i + x_i' \beta_x + \varepsilon_i)$$

where x is the vector of exogenous variables.

The error term ε is potentially correlated with the endogenous variable *exams* but is uncorrelated with x.

The control function is a two-step procedure that assumes a certain structural relationship between the endogenous regressor and other exogenous regressors. In the first stage, a linear model can be specified and tested for the endogenous variable:

$$exams_i = \gamma_x x_i' + z_i' \gamma_z + u_i$$

where z is a vector of instrumental variables, namely exogenous variables that affects *exams* but does not directly affect *reading*. A test of overidentifying restrictions will verify whether at least two instruments are valid. We assume that the error term ε can be specified as follows:

$$\varepsilon_i = \rho u_i + v_i$$

with $v_i \sim [0,\sigma^2_v]$, $\varepsilon_i \sim [0,\sigma^2_\varepsilon]$, and v_i independent of ε_i. *exams* can be considered an exogenous regressor only in the case in which $\rho=0$, otherwise it is endogenous, being correlated with ε.

After having estimated the first-step linear regression, the residuals must be stored and used as regressor in the second step count-data model. In this second step, we estimate, as suggested by Wooldrige (2010), a Poisson regression. As expected, if ρ is statistically different from zero, the variance-covariance matrix (VCE) must be estimated through bootstrap to get bias-corrected confidence intervals (sandwich estimator is valid only with independent observations).

3. Data

Our empirical investigation relies upon an on-line survey conducted among students enrolled at the University of Bologna (UniBo) in the period May-July 2010. The study included 27,616 answers, 16.40% of the UniBo students. Although it derives from a voluntary participation to the survey rather than from a pre-ordered sampling design, the sample structure is tested to be representative of the population (Table 1). The ages of the participants, which were categorized by their age in months, ranged from 18 to 28 years old; 10,876 of the answers (39.38% of the sample) were of males students and 16,740 (60.62%) of females.

As discussed above, the control-function approach requires, in the first step, the identification of a vector of instrumental variables that affects *exams*, but does not directly affect *reading*. We have identified four IVs that directly affect students' performance. The first regressor is the time devoting to attending lectures, *lecture_attend*, which is a signal of an important commitment to pass the exam. The other IVs reflect the perception of the importance that certain study tools (attending lectures, studying on notes or on syllabuses) plays to increase academic performance in terms of the number of exams passed. These variables are, respectively, *perc_lectures, perc_notes, perc_syllabus.*

Previous studies suggest that many other determinants affect recreational reading and should be included in the vector *x* of exogenous regressors. We consider four sets of independent variables: socio-demographic characteristics of respondents; university context; student characteristics; and cultural capital features.

Socio-demographic characteristics

Among socio-demographic features we include gender, *gender,* a dummy variable which assumes value 1 if female, zero otherwise. It has been found that a higher percentage of girls indulge in leisure reading than boys (Abilock, 2002; Swalander & Taube, 2007). Moreover, females show a more positive attitude to reading (see Logan, 2009; Abdul Karim and Hasan, 2007; Swalander & Taube, 2007; Van Schooten et al., 2004; Gallik, 1999; Stockmans, 1999; Kirsch and Guthrie, 1984) and a preference for reading a variety of genres compared to males (Clark, Osborne & Akerman, 2008).

Another variable often considered in studies on the effects of cultural capital on school achievement is *age,* since it affects the time assigned to specific cultural and leisure activities and reading preferences (Horvat and Davis, 2011; Abdul Karim and Hasan, 2007; Reay, 2004; Van Schooten et al., 2004; Levya, 2003; Kraaykamp, 1999; Stockmans, 1999; DiMaggio, 1997). Since we expect that students' age has a non-linear relationship with reading and studying, we also include in the list of regressors age squared, *agesq*.

University context

The enrollment Faculty implicitly detects set of preferences related to academic and cultural subjects. For example, we expect that a student enrolled in a BA in Classical Studies tends to spend more time in reading for leisure or academic purposes than a student enrolled in a chemistry BA because of the different types of studies and role of practices in laboratories. In this study, we use a dummy variable to capture these differences, *soc_hum,* a dummy which takes value 1 if students are enrolled in social science, humanities, classical studies, foreign languages and literature degrees, and zero otherwise.

The distance between the university location and student residence city too may affect the time devoted to reading and studying. For example, every day commuters spend time on car or public transport to move to/from the University city. During this time, they can do only a few activities, such as talking with friends, playing with electronic devices, making phone calls, reading for pleasure or studying. A dummy variable is introduced, *commuter,* which assumes value 1 if commuters, 0 otherwise. Similarly, students renting flats in the University city spend time to

organize their life (such as cooking, cleaning, etc.) differently from those students living with their family (residents and commuters). We therefore consider a dummy variable for commuter, *non_resident*, which assumes value 1 if nonresident students, 0 otherwise.

Student characteristics

Proficient students tend to read more for leisure and, following a virtuous circle, strong readers better perform at school (Van Schooten and de Glopper, 2003; Stokmans, 1999). For this reason, we use the high-school final mark, *mark*, as a proxy for student ability and we expect it positively affects the number of exams passed and the number of books read in a year.

The attitude to study on the textbooks or on complementary academic books, beside attending lectures, studying with classmates on notes, syllabuses, etc. often capture a higher propensity to make use of books, even outside the academic context. For this reason, we included both the attitude of studying on textbooks, *textbooks*, and consulting complementary books, *otherbooks*, in the list of regressors affecting the propensity to read for non-academic purposes.

Cultural capital

Family background, or more generally cultural capital, refers to variables strongly linked to activities in the home environment that support literacy development. As children grew up in the family, parents would have an influence on the students' attitude toward reading. They encouraged the children to read by involving in their reading, modelling leisure reading, creating and providing reading materials at home and fostering good self-concept as readers into the children self-esteem (Tramonte and Willms, 2010; Cheadle, 2009; Cheadle, 2008; Abdul Karim and Hasan, 2007; Mckool, 2007; Cheung and Andersen, 2003; Lareau and Weininger, 2003; Kraaykamp, 2003; Dumais, 2002; Partin, 2002; DeGraaf et al., 2000; Fitzegerald, 1997; Mohr and DiMaggio, 1995). We consider parental education by introducing in our model two categorical variables, for mother and father, *mother* and *father,* ranging from 1 to 4[1]. Moreover, to capture

[1] These variables assume value 1 if the parent has no education or finished the primary school; 2 if he/she finished the middle school; 3 if he/she got a high school diploma; 4 if he/she received a degree or higher level of education).

this point we include also the size of home library, *library*, a variable that contains the estimated number of books in the family house.

Table 1 summarizes the main statistics of the sample.

[TABLE 1 ABOUT HERE]

4. Results

To find out the main effect of the independent covariates on the dependent variable recreational reading, we use a count-data model – control function approach. Specifically, after having estimated a linear model for the endogenous variable *exams* and stored residuals, in the second step we have estimated a Poisson model to test the effects of the mentioned list of regressors, [2] included the first-step residuals, on *reading*. Since the coefficient of the first-step residuals is statistically different from zero, we have estimated the VCE matrix by bootstrap. The second column of Table 2 includes the Poisson estimates with bootstrapped standard errors.

Table 2 displays the estimated coefficients of the count-data control-function approach.

[TABLE 2 ABOUT HERE]

As expected, recreational reading is an activity time-consuming, which can conflict with non-leisure activity, included studying. The time constraint is, thus, binding for students enrolled at the university. Therefore, although in the long-run academic performances stimulate recreational reading, the opposite occurs during the university years. The larger the number of passed exams,

[2] Wooldridge (2010) suggests to run a Poisson regression in the second-step control-function procedure instead of a negative binomial or another count-data model because the overdispersion issue is solved in the first step.

the lower the time devoted to recreational reading. In other words, results seem to confirm that academic performance do kill recreational reading.

Moving to socio-demographic covariates, females pass a larger number of exams every year. Moreover, the endogenous variable is significantly affected by the age of students even if non-linearly: older students pass a larger number of exams. This effect is probably due to the fact that the basic and core exams, which often impose more effort, concentration and time, are concentrated in the first academic years. Additionally, freshmen often need some time to learn how to organize time and study at the university.

As far as University context is regarded, students enrolled in humanity, classical studies, foreign languages, social sciences seem to read more than students studying more technical or experimental subjects. Moreover, both commuters and non-resident students read more than resident students.

Brilliant students, with higher final mark at the secondary school, read (and study more) than less proficient students, triggering positive virtuous feedbacks. Studying on the textbook does not seem to affect academic results (in term of number of passed exams) whereas consulting other books worsens students' performances. Commuters register better quantitative academic performances than resident or non-resident students. Those who recognize a crucial role in studying on notes and syllabuses record better results in quantitative terms.

Finally, focusing on cultural capital, both mother and father education seem to affect performances, as well as the estimated number of books in the family house.

5. Multivariate decomposition

From the previous section, we observe that there is a difference in the role of gender in predicting recreational reading. In order to quantify how much of such a difference is due to differences in the distribution of characteristics between men and women (*endowment, explained or characteristic component, C*) or differences in the effects of these characteristics on recreational reading (*residual component*, also called unexplained, *coefficient or behavioral component, E*), in

this sub-section we used an extension of the Blinder-Oaxaca method applied to a count-data control-function model. Specifically, the decomposition is estimated in the second-step and the count-data model run is a Poisson regression (as suggested by Wooldridge, 2010).[3]

In detail, the mean difference in the dependent variable, *reading*, between *females (f)* and *males (m)*, can be decomposed as the sum of an endowment effect, *E,* and a coefficient effect*, C*:

$$\overline{reading_f} - \overline{reading_m} \begin{cases} = \overline{e^{X_f\beta_f}} - \overline{e^{X_m\beta_m}} \\ = \underbrace{\left\{\overline{e^{X_f\beta_f}} - \overline{e^{X_m\beta_f}}\right\}}_{E} - \underbrace{\left\{\overline{e^{X_m\beta_f}} - \overline{e^{X_m\beta_m}}\right\}}_{C} \\ = \sum_{k=1}^{K} W_{\Delta X_k} E + \sum_{k=1}^{K} W_{\Delta\beta_k} C = \sum_{k=1}^{K} E_k + \sum_{k=1}^{K} C_k \end{cases}$$

The differential part attributable to the differences in coefficients is the unexplained or coefficient component, *C*, that is the expected difference if males experienced females' behavior. The differential due to differences in characteristics or endowments is the explained or characteristic component, *E*, that is the expected difference if females were given males' distribution of characteristics.

The last equation shows that it is possible to decompose the explained and unexplained components into the contribution of each *k*th covariate. Therefore, the difference in the dependent variable can be expressed as weighted sums of covariate contributions. The method used is not affected by path dependency, namely, it is invariant to the order of the variables entered in the decomposition.

Table 1 contains the aggregate decomposition results.

[TABLES 3 ABOUT HERE]

[3] Multivariate decomposition is performed using mvdcmp package in Stata (Powers et al., 2011). It is based on the methods proposed by Powers and Yun (2009), extending the Oaxaca-Blinder decomposition method to nonlinear responses. In case of Poisson regression models, mvdcmp exactly decomposes the difference in the average observed outcomes (Agresti, 2002; Greene, 2008, Powers et al., 2011).

There is a clear difference between the groups in the way covariates impact on recreational reading. In fact, analysis shows that the endowment effect (E) accounts for only 11 per cent of the difference in recreational reading between men and women, while the residual effect (C) accounts for 89 per cent of such a difference.

The results from the detailed decomposition of the differences in academic performances between female and male students attributes to differences in characteristics (E) and to differences in coefficients (C) are displayed in Table 4.

[TABLES 4 ABOUT HERE]

Two main results emerge. Firstly, academic performances do not kill recreational reading, depending on gender. In fact, academic performance makes a statistically significant contribution to the difference in coefficients, because having higher academic performance (proxied by the number of exams per year) is associated with higher level of recreational reading for woman. In other words, female students would read a higher number of books if they had the same academic performance as male students. Why do female students read more? Since the most of the gap between female and male students can be attributed to a difference in coefficients, it is likely that idiosyncratic gender characteristics contribute to different attitude to recreational reading between female and male students. In other words, it is an attitudinal difference which is likely to start in early age and it is confirmed by our data on academic student population.

Secondly, overall, the detailed decomposition confirms that differences in academic performances are not due to different distribution of socio-demographic characteristics, University context, student characteristics or cultural capital between female and male students, but the way in which these contributions differently affect academic performance when gender is regarded. In fact, we find that almost all contributing factors are statistically significant, but magnitude vary significantly between the difference in characteristics decomposition and the difference in coefficients decomposition. This is especially the case for age, which is the first contributor when the residual effect is considered, while its contribution is low to explain the gap between female and men students when endowment is regarded, as illustrated in Figure 1a and Figure 1b.

[FIGURE 1a AND FIGURE 1b ABOUT HERE]

6. Conclusions

Although there exists an extensive literature on the effects of reading on academic achievement, to the best of our knowledge, the issue of the impact of academic performances on recreational reading has been neglected so far.

Using an on-line survey conducted among students of the University of Bologna in the period May-July 2010, a control-function approach to control for endogenous covariates has been used to investigate both students' leisure reading and studying habits. The main findings show that, whereas studying may positively affect reading attitude in the long run, during the university years the time and effort devoted to study shrinks the time left for recreational reading.

In order to explore in details differences between gender we also decompose the differences in recreational reading between female and male students using an extension of the Blinder-Oaxaca decomposition approach to nonlinear responses. The main findings show that, whereas the time and effort devoted to study reduces the time available for recreational reading, female students would read a higher number of books if they had the same academic performance of male students. But, at the same time, females could have stronger preferences for reading than males, and are more likely to sacrifice other leisure activities to increase reading. Anyway, whatever the work hypothesis, we can conclude that idiosyncratic gender characteristics contribute to different attitude to recreational reading between female and male students.

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TABLE 1. Descriptive statistics

	Type	no. Obs	Percentage	mean	min-max	std.dev.
reading (dependent variable)	C	25624		6.669	0-100	8.400
exams (endogenous variable)	C	26892		4.396	0.5-19	2.022
lecture_attend (IV)	O	27430		3.117	1-4	1.159
Importance of attending lecture to pass exam (IV)	O	27474		3.967	1-5	1.009
Importance of studying on notes to pass exam (IV)	O	27434		4.062	1-5	1.032
Importance of studying on syllabus to pass exam (IV)	O	27378		4.158	1-5	0.920
Socio-demographic characteristics						
gender (Female =1 ; Male=0)	D	27616	60.62%		0-1	0.489
age	C	24322		22.310	18-28	2.325
agesq	C	24322		503.158	324-784	106.815
University context						
soc_hum	D	27348	59.52%		0-1	0.491
commuter	D	27482	38.29%		0-1	0.486
non_resident	D	27482	42.86%		0-1	0.495
Student characteristics						
Mark	C	26620		83.798	60-100	12.480
textbooks	O	27616		4.114	0-5	1.021
otherbooks	O	27616		2.870	0-5	1.204
Cultural capital variables						
mother	O	27234		2.868	1-4	0.853
father	O	27062		2.836	1-4	0.888
library	C	22860		342.019	0-4500	496.343

O=ordinal variable; C=continuous variable ; D=dummy variable

TABLE 2. Count-data control-function model (bootstrapped standard errors)

VARIABLES	(First step – OLS model) exams	(Second step – Poisson model) reading
exams		-0.0935***
		(0.0249)
gender	0.0798***	0.1193***
	(0.0288)	(0.0175)
age	0.1061***	0.0307***
	(0.0109)	(0.0065)
agesq	-0.0009***	-0.0003***
	(0.0001)	(0.0001)
soc_hum	0.1093***	0.1702***
	(0.0312)	(0.0178)
commuter	0.0142***	0.0557**
	(0.0378)	(0.0234)
nonresident	-0.0535	0.0609***
	(0.0389)	(0.0230)
mark	0.0109***	0.0054***
	(0.0012)	(0.0008)
textbooks	0.0160	0.0146***
	(0.0152)	(0.0094)
otherbooks	-0.0875***	0.0381***
	(0.0126)	(0.0078)
mother	-0.0240	0.0339***
	(0.0199)	(0.0126)
father	-0.0252	0.0355***
	(0.0204)	(0.0122)
library	0.0000	0.0003***
	(0.000)	(0.000)
Lecture_attend (IV)	0.3276***	
	(0.0148)	
imp. attending lectures (IV)	0.0035	
	(0.0174)	
importance notes (IV)	0.0330**	
	(0.0157)	
Importance syllabus (IV)	0.0461***	
	(0.0150)	
Constant	0.3845	0.5863***
	(0.2633)	(0.1550)
1st step estimated residuals (rho)		0.0910***
		(0.0253)
observations	20772	
overidentification test (Hansen's J test)	chi2(3) = 5.63992 (p = 0.1305)	

*,**,***, significance at .01;.05;.10 per cent confidence level, respectively.

Bootstrapped standard errors in parentheses.

TABLE 3. Aggregate decomposition of the differences in academic performances between female and male students attributes to differences in characteristics (E) and to differences in coefficients (C)

	Coef.	Std. Err.	z	P > |z|
E	0.086	0.014	6.18	0.000
C	0.699	0.032	21.73	0.000

TABLE 4. Detailed decomposition

Due to differences in characteristics(E)	Coef.	Std. Err.	z	P > |z|
exams	-0,037	0,006	-6.41	0.000
age	-0,026	0,004	-5.77	0.000
agesq	0,020	0,004	5.48	0.000
soc_hum	0,080	0,010	8.13	0.000
commuter	0,015	0,002	8.14	0.000
nonresident	-0,002	0,000	-9.95	0.000
mark	0,071	0,005	15.29	0.000
textbooks	0,020	0,006	3.47	0.001
otherbooks	0,029	0,003	8.88	0.000
mother	-0,012	0,001	-7.98	0.000
father	-0,010	0,002	-5.08	0.000
library			-40.21	0.000
Due to differences in coefficients(C)	Coef.	Std. Err.	z	P > |z|
exams	3,185	0,371	8.57	0.000
age	-8,544	0,678	-12.60	0.000
agesq	3,41	0,276	12.37	0.000
soc_hum	-0,608	0,027	-22.15	0.000
commuter	0,174	0,032	5.40	0.000
nonresident	0,249	0,036	6.83	0.000
mark	-0,914	0,227	-4.02	0.000
textbooks	0,071	0,133	0.54	0.590
otherbooks	-0,791	0,559	-6.06	0.000
mother	0,122	0,134	0.91	0.363
father	-0,808	0,125	-6.47	0.000
library	0,037	0,011		
constant	4.791	0.559	8.57	0.000

FIGURE 1a. Detailed decomposition results: contribution of difference in characteristics

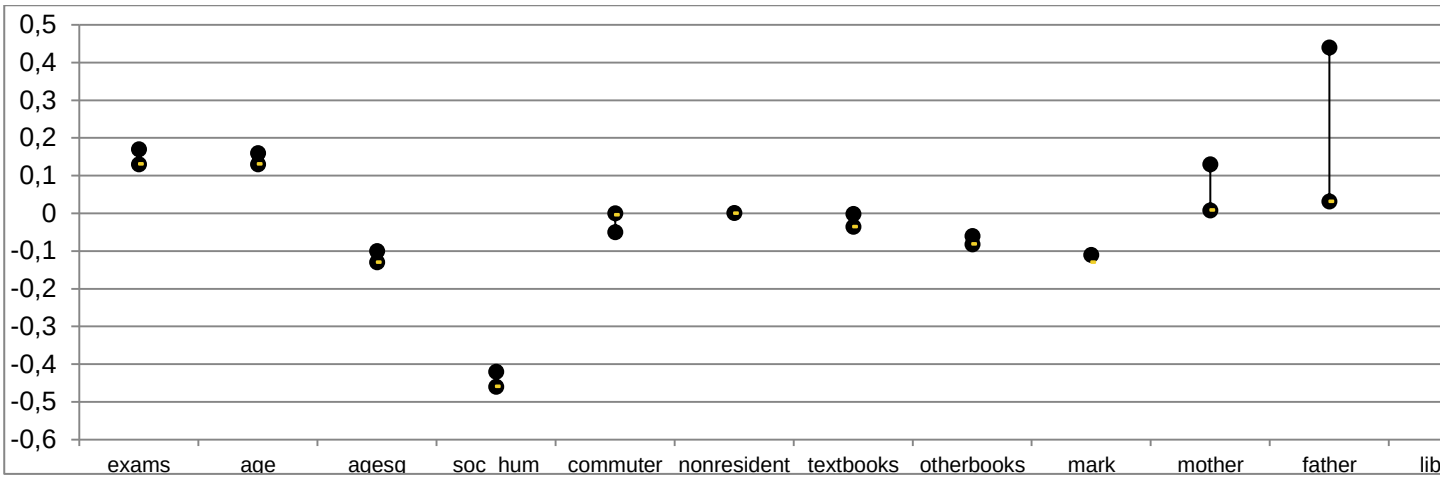

FIGURE 1b. Detailed decomposition results: contribution of difference in coefficients