



Psicothema

ISSN: 0214-9915

psicothema@cop.es

Colegio Oficial de Psicólogos del

Principado de Asturias

España

Fernández-Alonso, Rubén; Álvarez-Díaz, Marcos; Woitschach, Pamela; Suárez-Álvarez, Javier; Cuesta, Marcelino

Parental involvement and academic performance: Less control and more communication

Psicothema, vol. 29, núm. 4, 2017, pp. 453-461

Colegio Oficial de Psicólogos del Principado de Asturias

Oviedo, España

Available in: <http://www.redalyc.org/articulo.oa?id=72753218004>

- How to cite
- Complete issue
- More information about this article
- Journal's homepage in redalyc.org

redalyc.org

Scientific Information System

Network of Scientific Journals from Latin America, the Caribbean, Spain and Portugal

Non-profit academic project, developed under the open access initiative

Parental involvement and academic performance: Less control and more communication

Rubén Fernández-Alonso^{1,2}, Marcos Álvarez-Díaz¹, Pamela Woitschach³, Javier Suárez-Álvarez²
and Marcelino Cuesta²

¹ Consejería de Educación y Cultura del Principado de Asturias, ² Universidad de Oviedo and ³ Universidad Complutense de Madrid

Abstract

Background: Parental involvement in the educational process is desirable, although more involvement does not guarantee better results. The aim of this research is to explore the relationship between styles of parental involvement at home and academic performance. **Method:** A random sample of 26,543 Spanish students was used, with a mean age of 14.4 (SD = 0.75). Two thirds (66.2%) attended a publicly funded school; 49.7% were girls; 87.8% had Spanish nationality; and 73.5% were in the school year corresponding to their age. Different three-level hierarchical-linear models were fitted: student, school, and region (autonomous community). **Results:** Students whose parents exhibited a more distal or indirect profile of family involvement tended to demonstrate better results than those from homes with a more controlling style. Parental involvement styles have an effect on achievement at an individual and school level, even after accounting for the effect of context or background variables. **Conclusions:** Given the importance of parental involvement in academic performance, schools should consider it in their family information and training policies. Schools which have more communicative family profiles tend to demonstrate lower levels of intra-school differences in students' academic performance.

Keywords: Family involvement, academic performance, multilevel analysis, secondary education.

Resumen

Implicación familiar y rendimiento académico: menos control y más comunicación. Antecedentes: la implicación familiar en el proceso educativo es un hecho deseable, aunque una mayor implicación no garantiza mejores resultados. El objetivo de esta investigación es explorar la relación entre los estilos de implicación familiar en el hogar y los resultados escolares. **Método:** se utilizó una muestra de 26.543 estudiantes españoles con una medida de edad de 14,4 años (DT = 0,75). El 66,2% asiste a un centro público; el 49,7% son mujeres; el 87,8% es español; y el 73,5% está escolarizado en el curso correspondiente a su edad. Se ajustaron diferentes modelos jerárquico-lineales de tres niveles: alumnado, centro y región. **Resultados:** los estudiantes cuyos progenitores presentan un perfil de implicación familiar más distal o indirecto tienden a presentar mejores resultados que los que provienen de hogares con un estilo más controlador. Los estilos familiares tienen efecto sobre los resultados individuales y de centro, incluso después de descontar el impacto de las variables de contexto. **Conclusiones:** dada la importancia de la implicación familiar en el rendimiento, los centros deben de tenerla muy en cuenta en su política de información y formación familiar. Los centros que tienen perfiles familiares más comunicativos tienden a presentar menores diferencias intra-centro en los resultados individuales.

Palabras clave: implicación familiar, rendimiento académico, análisis multinivel, enseñanza secundaria.

The debate about the effect of parental involvement on school results has been ongoing for at least a hundred years (Brooks, 1916), and has produced thousands of papers and empirical studies. This century alone has seen the publication of a number of compilations (Hoover-Dempsey, Battiato, Walter, Reed, DeJong, & Jones, 2001; Pomerantz, Moorman, & Litwack, 2007; Suárez, Fernández, Cerezo, Rodríguez, Rosário, & Núñez, 2012), general meta-analyses (Castro, Expósito-Casas, López-Martín, Lizasoain, Navarro-Asencio, & Gaviria, 2015; Fan & Chen,

2001; Hill & Tyson, 2009; Jeynes, 2003, 2005, 2007, 2016), meta-analyses focused on specific areas such as: the role of families in the acquisition of reading skills (Sénéchal & Young, 2008), help with homework (Patall, Cooper, & Robinson, 2008), evaluation of programs designed to promote parental involvement (Erion, 2006; Jeynes, 2012), and qualitative meta-syntheses (Wilder, 2014), not forgetting reviews from the perspective of school effectiveness, which indicate that parental involvement is the non-teaching factor with the largest effect size on academic performance (Murillo, 2007; Scheerens, 2016; Scheerens, Witziers, & Steen, 2013).

Taken together, these references allow one to assert that the association between parental involvement and educational results has been reproduced across various ages, ethnic groups, countries, and cultures, so much so that it may be regarded as axiomatic, and it has been recognised as such in European educational legislation (Eurydice, 1997). However, the term "parental involvement" is

multifaceted and multidimensional, and when examined in detail, the statement above becomes imprecise and unclear. The variety of meanings (dimensions), mechanisms (parenting styles), and contexts (student's age, ethnicity, or socioeconomic level) of parental involvement, together with the diversity of research (different designs, analysis methods, methods of estimation of school results) mean that conclusions fluctuate and are occasionally contradictory. Hill and Tyson (2009), combining theoretical frameworks from Epstein (1987), and Grolnick and Slowiaczek (1994), use a classification which, as well as being parsimonious, allows reasonable evaluation of evidence about parental involvement, indicating three meanings of the term: academic socialization, school-based involvement and home-based involvement. The first refers to the expectations, value, and usefulness the families confer on education and is the dimension which is most closely connected to academic performance (Castro et al., 2015; Fan & Chen, 2001; Hill & Tyson, 2009; Jeynes, 2007, 2016; Wilder, 2014). School-based involvement includes attendance at parent-teacher, and other meetings, helping with school activities, and participation in the running of the school. Fan and Chen (2001), Hill and Tyson (2009), Jeynes (2016) and Pomerantz et al. (2007) indicate a positive, significant association between this dimension and academic performance. However, Castro et al. (2015) did not find any significant effects, nor did Jeynes' meta-analysis produce stable results (Jeynes, 2003), leading to the conclusion that the effect of attendance and participation in school activities on achievement is negligible once adjustments are made for background variables (Jeynes, 2007). Finally, home-based involvement covers support and cultural opportunities, communication about school matters, and direct assistance with homework at home. This is surely the most controversial meaning and is where the phrase "*more is not always better*" applies (Pomerantz et al., 2007).

This research explores the effect of two measures of home-based involvement: help and monitoring of homework, and communication and support of the educational process. Research into the association between school achievement and parental involvement in homework has given mixed results (Cooper, Steenbergen-Hu, & Dent, 2012; Hoover-Dempsey et al., 2001; Pomerantz et al., 2007). Fay and Chen (2001) produced the only meta-analysis which reported a positive, significant effect ($d = .20$) between homework supervision and achievement. In contrast, Castro et al. (2015) found practically no correlation ($r = .02$), and in Jeynes' studies, the values ranged between an absence of statistical significance when using adjustment variables (Jeynes, 2007), and small negative effects (Jeynes, 2005). Finally, Hill and Tyson (2009) talk of a negative, significant association. All of this would seem to confirm the evaluation made by Patall et al. (2008), which stated that in most cases, parental help with and supervision of homework has little effect on academic results.

One plausible explanation for this data is that a parenting style which is controlling and intrusive when it comes to homework reduces a child's autonomy and responsibility, and working autonomously is specifically one of the keys to academic achievement (Fernández, Suárez-Álvarez, & Muñiz, 2014, 2015). On the other hand, more indirect styles of parental involvement, such as support and communication about school matters, demonstrate more association with academic achievement (Fernández-Alonso, Suárez-Álvarez, & Muñiz, 2016; Trautwein & Lüdtke, 2009). There is ample evidence to indicate that children in homes which encourage their autonomy and responsibility

show improvements in academic performance, as well as in motivation, attitude towards subjects, planning skills, and self-regulation (Cooper, Lindsay, & Nye 2000; Dumont, Trautwein, Lüdtke, Neumann, Niggli, & Schyns, 2012; Gonida & Cortina, 2014; Hagger, Sultan, Hardcastle, & Chatzisarantis, 2015; Katz, Kaplan, & Buzukashvily, 2011; Pattall et al., 2008; Pomerantz et al., 2007; Núñez, Suárez, Rosário, Vallejo, Valle, & Epstein, 2015; Rodríguez, Piñero, Gómez-Taibo, Regueiro, Estévez, & Valle, 2017; Valle, Pan, Regueiro, Suárez, Tuero, & Nunes, 2015).

Not all home-based involvement has positive effects. Hill and Tyson (2009), probably show this most clearly. Initially they find that the correlation between measures of home-based involvement and achievement are practically nil ($r = .03$). However, this is the product of two involvement styles which do have significant effects, albeit contradictory: on the one hand, help with school homework ($r = -.11$), and on the other, communication about school activities and encouragement of a learning environment at home ($r = .12$). Regardless, it must be borne in mind that these family involvement styles are not stable over time, but rather develop reactively according to school circumstances. So, for example, parents of children who are more demotivated, or who have greater learning difficulties in primary education, tend to exhibit more controlling behaviours and direct intervention in secondary education (Dumont, Trautwein, Nagy, & Nagengast, 2014).

In this context, the current study aims to explore the relationship between styles of home-based involvement and school achievement. There are two specific objectives, firstly, to analyse the differential effect of communication and parental supervision on results. It is expected that children whose parents exhibit more controlling behaviour will have worse results compared to those children whose families exhibit more indirect support behaviour. The second objective is to analyse how the amount of communication affects the distribution of results in the school. In order to do that, it is necessary to test a hitherto unexplored hypothesis which is; that schools with, on average, more distant or indirect family support profiles will have smaller differences in their students' academic achievement. If it were confirmed, this hypothesis would have clear implications for school policies, as it would mean that an appropriate style of parental involvement at home could impact the school's overall results, as well as the distribution of results within the school.

Method

Participants

The population was defined as students in the second year of obligatory secondary education (ESO) in Spain in the academic year 2009/10. In order to have a representative sample by autonomous community the sampling considered each region as an explicit stratum. In each stratum the sample was selected following a two stage design similar to that used in international educational studies (OECD, 2009, 2014; Ministerio de Educación, 2011).

In the first stage, the participating schools were selected with a probability proportional to their size, and in the second stage, within each previously selected school, 35 students were chosen through systematic random sampling. The sample produced was made up of 29,153 students from 933 schools. Discounting absences on the day of the test and those students with special

educational needs gave a final sample of 26,543 pupils, with a mean age of 14.4 (SD = 0.75). About two-thirds (66.2%) of the pupils attended state schools; 47.9% were girls; 87.8% had Spanish nationality; and 73.5% were in the school year corresponding to their age.

Instruments

Because this was an official evaluation, the instruments were produced by experts in various fields of study who were contracted by the Spanish Ministry of Education, Culture and Sport, in collaboration with the regional (autonomous community) education authorities.

Tests of academic performance

The battery of tests consisted of 342 items in different subjects: Spanish Language (106 items), Mathematics (73 items), Science (78), Citizenship (85). The items had binary scoring except for 21 items of partial credit which were coded on a scale between 0 and 2 points. As students could not answer all of the questions in the time assigned to the evaluation, the items were distributed in booklets following a partially balanced incomplete block design (Fernández-Alonso & Muñiz, 2011). The mean Cronbach alpha for the booklets ranged between .72 (Mathematics) and .89 (Spanish Language). The students' scores were calculated adjusting the bank of items to Rasch's model using ConQuest 2.0 software (Wu, Adams, Wilson, & Haldane, 2007), and were expressed via 5 plausible values on a scale with a mean of 500 points and standard deviation of 100. In evaluations of the education system which use massive samples, the method of plausible values captures the population parameters (e.g. mean, standard deviation) better than maximum likelihood procedures or a-posteriori Bayesian methods (Mislevy, Beaton, Kaplan, & Sheehan, 1992; OECD, 2009; von Davier, González, & Mislevy, 2009).

Student questionnaire

The questionnaire contained a series of double questions with exactly the same formulation except for half referring to mothers, and half to fathers. Exploratory analyses indicated that students' answers involve two factors: one with items related to the mother, and the other related to the father. Therefore it was decided to separate the two variables related to parental control and communication for each of the parents. The item *Control that the mother (or father) exerts over homework*, was constructed from three items: "My mother (father)..." (1) "asks me whether I have homework"; (2) "checks whether I have homework"; "helps me to do homework". The item *Communication with the mother (or father) about school matters* was constructed with five items: "My mother (father)..." (1) "is concerned about my work and study habits"; (2) "encourages me to study"; (3) "asks me how my classes were"; (4) "is concerned about my results and school grades"; (5) "is concerned about my behaviour and my relationships with classmates". Confirmatory factor analysis verified that the items fit the four factor model: two variables (control and communication) per parent. This model has a satisfactory fit ($\chi^2 = 26947.079$, $df = 98$, $p < .001$; CFI = .941; TLI = .928; RMSEA = .100). Finally, in order to check whether parental behaviour and attitudes have school-level effects, the means of the variables *Parental control*

over homework and *Parental communication about school matters* were calculated.

Control variables

Four variables were used to describe students' sociological contexts, three of which were binary: *Gender* (1 = female); *Nationality* (1 = Spanish; 0 = other); *School type* (1 = public; 0 = private). The fourth variable was the *Socioeconomic and cultural index* (SECI), which was constructed from the parents' educational attainment and professions, and from the availability of certain material and cultural resources in the home. It was expressed in normalised scores $N(0, 1)$. Three variables were used to describe the student's educational context: *In the school year corresponding to age* (1 = yes; 0 = has repeated/is repeating a year), *Academic expectations* and *Motivation*, the latter two variables were included as they had been found to be connected to academic achievement in previous research (Suárez-Álvarez, Fernández-Alonso, & Muñiz, 2014). In *ex-post facto* study they may be considered background variables the students bring with them on the day of the evaluation. *Academic expectations* were measured with a multiple choice item scored as the educational year corresponding to the respondents' expressed expectation: compulsory education (10 points); post-compulsory secondary education (12 points); non-university further education (14 points); university level qualification (16 points). The *Motivation* variable was constructed via the evaluation of six statements scored on a four-point Likert-type scale where 1 meant strongly disagree and 4 meant strongly agree. Students scoring highly in this variable were more in agreement with statements such as "at school I learn things which are useful and interesting". The scale was constructed from a confirmatory analysis using the robust maximum likelihood method (MLMV) and the items fit an essentially unidimensional scale: CFI = .954; TLI = .915; SRMR = .037; RMSEA = .087 (90% CI = .084 - .091).

Procedure

The application of the test was contracted out via public tendering and was performed by expert personnel who were external to the school. The evaluation was over two days, each with two 50-minute sessions separated by a break. At the end of the second day the students completed a context questionnaire which included the questions from which this study's independent variables were constructed.

Data analysis

First, the descriptive statistics and Pearson correlations were calculated. Following that, HLM 6.03 software (Raudenbush, Bryk, Cheong, & Congdon, 2004), was used to fit two three-level linear-hierarchical models (student, school, autonomous community) for each evaluated subject: a null model (with no predictors) and a random intercept model where the variables of interest and adjustment variables were introduced at the same time. Because HLM does not return standardised coefficients, the variables were normalised around the general mean, which allowed the results to be interpreted as the standardised coefficient from classical regression analysis. The level 2 and 3 variables which were created as school means of level 1 variable were not

renormalised. The level 1 variables were added without being centred with the exception of: motivation, expectations, and socioeconomic and cultural level, which were centred on the classroom mean to control class-group composition effects (Xu & Wu, 2013). The range of missing values is very small, between 1% and 3%. Recovery of those missing values was carried out using the procedure described in Fernández-Alonso, Suárez-Álvarez, and Muñiz (2012).

The results are presented in two ways: the tables show standardised coefficients, whereas the graphs show the real scale of the results, taking advantage of the fact that a scale with 100 points of standard deviation allows the expression of the effects and differences between groups as the percentage increment of standard points.

Results

Table 1 gives the descriptive statistics and correlation matrix for the variables in the study.

Table 2 shows the standardised coefficients for prediction of results in each subject and the percentage of variance explained in each level of analysis. The adjustment variables operated along expected lines and the models explain around 20% of the variance between students, between 50% and 60% of the variance between schools, and between 40% and 70% of the variance between regions.

Student’s perceptions of family involvement play an important role in the model. Parents’ controlling behaviour exhibits a negative effect, ranging between $\beta = -0.05$ and -0.09 depending on the subject, whereas parental support and communication demonstrate differential effects depending on the parent: a positive impact in

the case of mothers, and practically null in the case of fathers. The effects of the variables of interest are also significant at the school level. Those schools in which students perceive more controlling behaviour on the part of their parents tend to demonstrate lower results, and those schools with higher levels of communication tend to show better results.

The combination of the effects of both factors produces predicted differences of between 1.1 and 1.4 standard deviations of the scale of results between two schools with notional scores in the extremes in control and support/communication. However, the two factors are closely related to one another ($r = .55$ at level 1 and $r = .53$ at level 2) which means that in practice, the differences are more moderate. Figure 1 illustrates the prediction in Spanish Language for a student at four school-types, in other words, four schools which are representative of “clusters” of schools based on their average scores in the control and communication factors. The difference between schools with the best and worst balance of control and communication factors is estimated to be around 25% of the scale’s standard deviation. In general, better results are expected from those schools which combine less control and more parental communication, which is the only school-type which exhibits improvements over the base profile.

The second objective of this study is to examine whether parental involvement profiles may be associated with the distribution of the students’ results within a school. By way of illustration, figure 2 shows the relationship between schools’ means and standard deviations in the family communication index. The correlation is high and negative ($r = -.86$), in other words, schools with higher levels of communication tend to exhibit less variation in this index. The regression gradient indicates that in schools with lower average family communication, the dispersion of that

Table 1
Descriptive statistics and Pearson correlation matrix between the variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1 Mathematics	–																			
2 Spanish	.45	–																		
3 Science	.48	.61	–																	
4 Citizenship	.42	.59	.55	–																
5 SECI	.29	.36	.34	.29	–															
6 Female	-.05	.11	-.05	.13	-.01	–														
7 Spanish national	.12	.16	.14	.12	.18	-.01	–													
8 Appropriate school year	.26	.34	.32	.28	.31	.08	.15	–												
9 Expectations	.26	.38	.33	.35	.36	.13	.07	.42	–											
10 Motivation	.02	.06	.06	.11	-.02	.12	-.04	.06	.16	–										
11 Control Mother	-.08	-.09	-.09	-.08	.02	-.07	.03	.01	.02	.16	–									
12 Control Father	-.04	-.03	-.02	-.02	-.06	.03	-.02	-.03	.00	.21	.11	–								
13 Communication Mother	.07	.11	.10	.12	.14	.03	.07	.14	.17	.23	.46	.10	–							
14 Communication Father	.04	.06	.06	.07	.15	-.02	.07	.11	.14	.21	.33	.08	.48	–						
15 State school	-.15	-.21	-.17	-.19	-.29	-.01	-.09	-.12	-.16	-.01	.02	.05	-.05	-.05	–					
16 School SEC	.25	.31	.28	.24	.55	.01	.11	.21	.23	-.06	-.05	-.08	.06	.06	-.53	–				
17 School level Parental Control	-.09	-.09	-.10	-.08	-.06	-.03	.04	-.03	-.02	.09	.24	.04	.10	.13	.06	-.11	–			
18 School level Parental Support	.09	.12	.11	.12	.16	.00	.11	.09	.11	.09	.12	.00	.21	.22	-.22	.30	.54	–		
19 AC SECI	.17	.16	.16	.11	.24	.01	-.04	.10	.05	-.13	-.08	-.06	.00	-.01	-.17	.44	-.28	-.02	–	
Mean	506	510	509	508	0.06	0.51	0.88	0.76	14.1	2.87	0.63	0.51	0.89	0.78	0.65	0.06	0.57	0.84	0.06	
Standard deviation	99.4	95.7	96.4	97.1	1.00	0.50	0.33	0.43	2.34	0.49	0.34	0.40	0.21	0.30	0.48	0.55	0.09	0.06	0.24	
Asymmetry	0.17	-0.14	-0.05	-0.18	-0.18	-0.03	-2.34	-1.19	-0.54	-0.39	-0.44	-0.02	-2.39	-1.35	-0.65	0.01	0.07	-0.54	-0.11	
Kurtosis	0.13	0.11	0.05	-0.07	-0.53	-2.00	3.46	-0.59	-1.48	0.62	-0.97	-1.53	5.75	0.75	-1.58	-0.01	0.39	0.64	-0.55	

Table 2
Multilevel models for prediction of achievement in four subjects

	Mathematics β (SE)	Science β (SE)	Spanish β (SE)	Citizenship β (SE)
Control variables				
Level 1 (student)				
SECI	.128 (.010) ***	.148 (.007) ***	.153 (.009) ***	.118 (.007) ***
Women	-.090 (.007) ***	-.109 (.007) ***	.048 (.007) ***	.069 (.008) ***
Country: Spain	.062 (.007) ***	.070 (.008) ***	.089 (.007) ***	.060 (.007) ***
Appropriate school year	.119 (.008) ***	.153 (.007) ***	.149 (.008) ***	.117 (.007) ***
Expectations	.141 (.009) ***	.183 (.011) ***	.202 (.009) ***	.194 (.008) ***
Motivation	.033 (.007) ***	.063 (.008) ***	.038 (.006) ***	.069 (.007) ***
Level 2 (school)				
State school	-.021 (.012)	-.029 (.010) **	-.056 (.013) ***	-.080 (.011) ***
School SECI	.164 (.012) ***	.099 (.013) ***	.197 (.021) ***	.141 (.014) ***
Level 3 (AC)				
AC SECI	.281 (.113) *	.129 (.216)	.126 (.196)	.005 (.204)
Variables of interest				
Level 1 (student)				
Mother supervises homework	-.079 (.008) ***	-.083 (.008) ***	-.087 (.006) ***	-.083 (.006) ***
Father supervises homework	-.052 (.010) ***	-.081 (.009) ***	-.063 (.008) ***	-.077 (.007) ***
Communication with mother	.029 (.007) ***	.046 (.009) ***	.052 (.008) ***	.052 (.008) ***
Communication with father	.009 (.008)	.015 (.009)	.007 (.007)	.016 (.007) *
Level 2 (school)				
Parental supervision of homework	-.050 (.013) ***	-.072 (.018) ***	-.055 (.022) **	-.062 (.021) **
Communication with family	.052 (.012) ***	.069 (.014) ***	.067 (.012) ***	.074 (.017) ***
Percentage of variance explained				
Level 1	19.0%	17.4%	20.1%	16.4%
Level 2	49.1%	65.5%	60.5%	48.7%
Level 3	71.5%	59.2%	53.8%	42.1%

* p < .05; ** p < .01; *** p < .001

Note: β = Standardized weight; SE = Standard Error; SECI: Socioeconomic and cultural index; AC: Autonomous Communities

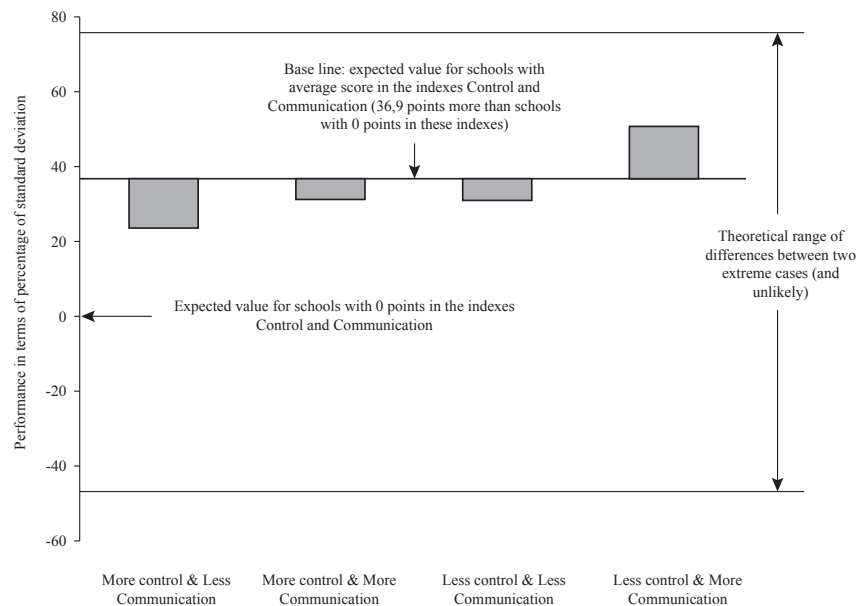


Figure 1. Predicted differences in Spanish Language according to school profile of family involvement

index is three times that of schools with higher indexes of family communication.

Figure 3 demonstrates the effect of the combination of the mean and dispersion of family communication on the results in Spanish Language in two school-types: school-type 1 with low levels of parental communication, and school-type 2 with high levels of parental communication. Similar results were found in the other school subjects examined (not shown here to avoid repetition).

The difference between school-types 1 and 2 is around 20 standard deviation points in favour of school-type 2 as that mix of families demonstrates higher levels of communication and support than the families in school-type 1. In addition, within the type 2 school, the model predicts that the differences in student results due to parental communication will be much smaller between those students with higher and lower levels of maternal communication, and will be around 5% of the standard deviation.

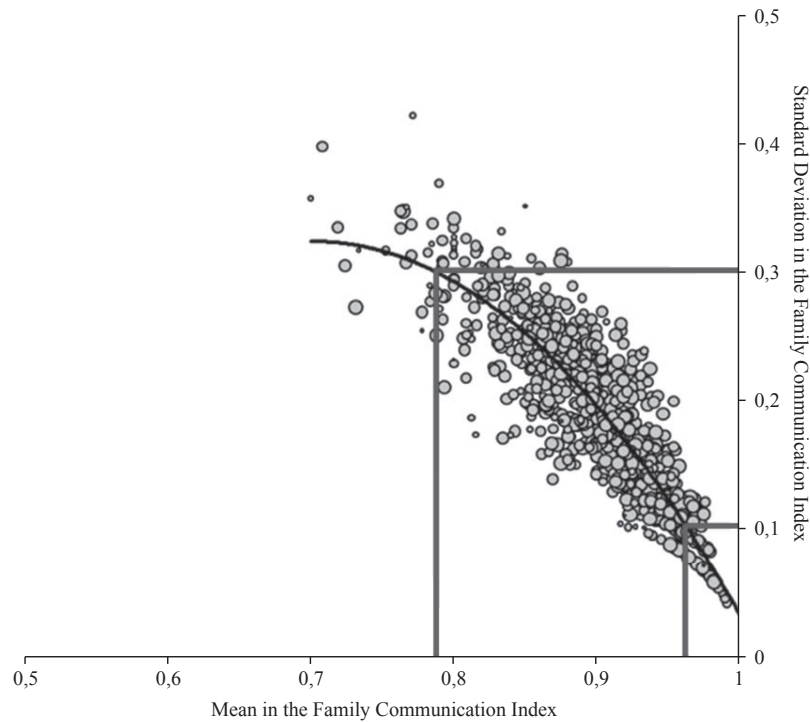


Figure 2. Relationship between mean and standard deviation for the Support and Family communication index by school

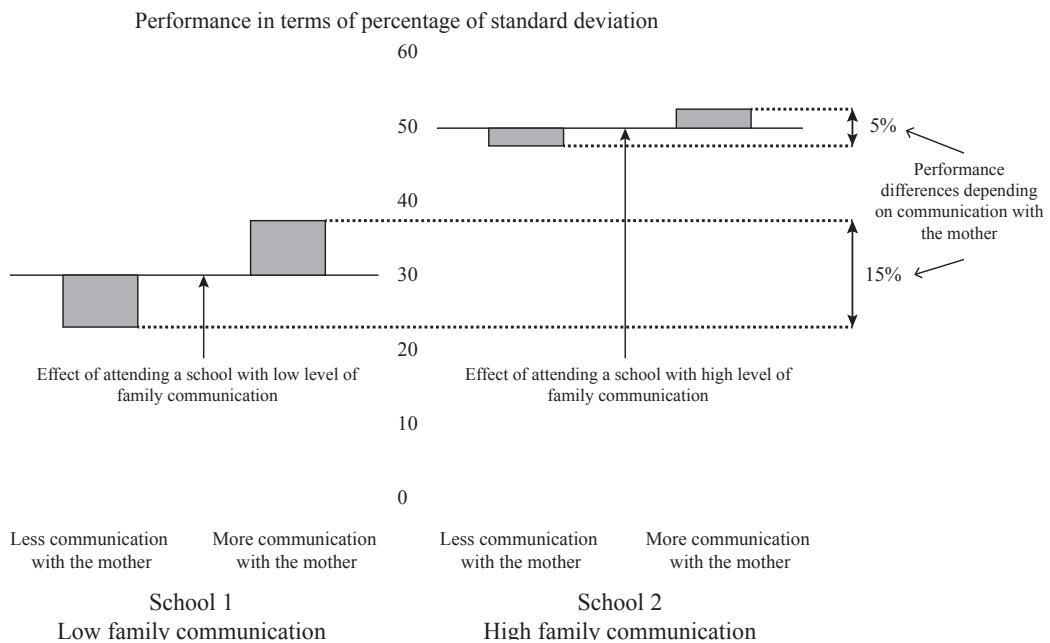


Figure 3. Prediction of the variation of results in Spanish Language in two schools according to levels of communication with the mother by school

However, the model predicts that the differences between students in schools with lower indexes of family communication may be three times as great.

Discussion

This research has evaluated styles of family involvement at home via students' perceptions. Various authors agree that students' perceptions describe the styles of involvement in the home better than the parents own opinions, which are, on occasion, biased by social desirability (Dumont et al., 2012; Núñez et al., 2015; Trautwein & Lüdtke, 2009).

The results are consistent with the first proposed hypothesis: the way that parents involve themselves in their children's education is associated with differential effects in academic performance. The controlling style is negatively correlated with academic achievement, which agrees with the conclusions from Hill and Tyson (2009) and seems less optimistic than results offered by Castro et al. (2015), Cooper et al. (2012), and Pattall et al. (2008) which reported non-significant effects. The communicative style is positively related with academic results, in line with Fernández-Alonso et al. (2016) and Trautwein and Lüdtke (2009). The data are in agreement with evidence indicating that when family involvement is measured using distal measures of support (family communication about school matters) there are clearer effects than when the measures refer to the amount of help with homework (Trautwein & Lüdtke, 2009), and the results conform with research indicating that less interventionist parental styles which encourage children's autonomy are associated with better academic results (Cooper et al., 2000; Dumont et al., 2012, 2014; Rodríguez et al., 2017).

In any case, these styles are neither independent nor stable. The correlation between controlling and communicative styles has been found to be high and positive, as previously reported in, for example Núñez et al. (2015), in other words, students who perceive more parental control over homework also report having better communication with their parents about school matters, which suggests the need to find an appropriate balance between the amount of direct help parents give their children, and the support and encouragement of autonomy. As for stability, the involvement styles are instead, reactive to the school experience, as parents tend to exhibit more controlling behaviours when their children are less motivated or have an educational history with more difficulties in learning (Dumont et al., 2014; Mora & Escardibul, 2016).

The data indicate that the effects of parental involvement appear at both the individual and the school level, which confirms the multilevel nature of parental involvement in the educational process, something already noted in previous research (Fernández-Alonso et al., 2016; Trautwein & Lüdtke, 2009; Xu & Wu, 2013). From an educational point of view, the second (school) level

effects are particularly important as the potential improvements that are predicted are not for individual students alone but rather the student body as a whole (Fernández-Alonso, Álvarez-Díaz, Suárez-Álvarez, & Muñiz, 2017). In this sense, the results referring to the second hypothesis seem to indicate that the school mean scores in communication level may be considered a good "proxy" of the educational style of the school community, which has substantial effects not only on predicting school results but also on the variability of those results within each school. Those schools whose families demonstrated higher levels of communication tended to exhibit lower levels of differences in student results, which might be capturing the effect of educational communities where the families, in combination, demonstrate an appropriate, consistent style of involvement in terms of the academic results. This evidence indicates the need, as other studies have already noted (Cunha et al., 2015), to promote school policies aimed at improving the quality of parental involvement at home.

When interpreting the results of this research it is important to bear in mind a number of considerations. Recent research in this area shows that students' previous knowledge (i.e. their academic performance prior to the evaluation) is one of the best predictors of future academic performance (Fernández-Alonso et al., 2015). Ideally, the models presented in this study would include measures of students' previous performance together with their socioeconomic level and the other control variables. In this way there would have been a clearer picture of the effect of parental styles on academic achievement in the schools and their students. Aware of this limitation, the current study includes powerful predictor variables such as socioeconomic level, motivation, and student expectations (Suárez-Álvarez et al., 2014) in addition to nationality, gender, and school type as control variables in the predictive models. More evidence would be needed to confirm whether the differences produced by parental styles on achievement are independent of socioeconomic level, gender, nationality, repeating school years, motivation, or school type at the student, school and autonomous community level. From a methodological point of view, future work will have to take into account recent developments in the construction of measuring instruments to ensure the most objective results possible (Haladyna & Rodríguez, 2013; Moreno, Martínez, & Muñiz, 2015; Solís-Salazar, 2015).

Acknowledgements

This research was funded by the Ministerio de Economía y Competitividad del Gobierno de España. References: PSI2014-56114-P, BES2012-053488. We would like to express our utmost gratitude to the Ministerio de Educación Cultura y Deporte del Gobierno de España and to the Consejería de Educación y Cultura del Gobierno del Principado de Asturias, without whose collaboration this research would not have been possible.

References

- Brooks, E. C. (1916). The value of home study under parental supervision. *The Elementary School Journal*, 17(3), 187-194. doi: 10.1086/454537
- Castro, M., Expósito-Casas, E., López-Martín, E., Lizasoain, L., Navarro-Asencio, E., & Gaviria, J. L. (2015). Parental involvement on student achievement: A meta-analysis. *Educational Research Review*, 14, 33-46. doi: 10.1016/j.edurev.2015.01.002
- Cooper, H., Lindsay, J. J., & Nye, B. (2000). Homework in the home: How student, family, and parenting-style differences relate to the homework process. *Contemporary Educational Psychology*, 25(4), 464-487. doi: 10.1006/ceps.1999.1036
- Cooper, H., Steenbergen-Hu, S., & Dent, A. L. (2012). Homework. In K. R. Harris, S. Graham & T. Urduan (Eds.), *APA educational psychology*

- handbook, Vol. 3: Application to learning and teaching (pp. 475-495). Washington, DC, US: American Psychological Association.
- Cunha, J., Rosário, P., Macedo, L., Nunes, A. R., Fuentes, S., Pinto, R., & Suárez, N. (2015). Parents' conceptions of their homework involvement in elementary school. *Psicothema*, 27(2), 159-165. doi: 10.7334/psicothema2014.210
- Dumont, H., Trautwein, U., Lüdtke, O., Neumann, M., Niggli, A., & Schyns, I. (2012). Does parental homework involvement mediate the relationship between family background and educational outcomes? *Contemporary Educational Psychology*, 37(1), 55-69. doi: 10.1016/j.cedpsych.2011.09.004
- Dumont, H., Trautwein, U., Nagy, G., & Nagengast, B. (2014). Quality of parental homework involvement: Predictors and reciprocal relations with academic functioning in the Reading domain. *Journal of Educational Psychology*, 106(1), 144-161. doi: 10.1037/a0034100
- Epstein, J. L. (1987). Toward a theory of family-school connections: Teacher practices and parent involvement. In Hurrelman, K., Kaufman, F.X., & Losel, F. (Eds.), *Social intervention: Potential and constraints* (pp. 121-136) de Gruyter: Berlin.
- Eurydice (1997). *The role of parents in the educational systems of Europe*. Brussels: European Commission.
- Erion, J. (2006). Parent tutoring: A meta-analysis. *Education and Treatment of Children*, 29(1), 79-106.
- Fan, X., & Chen, M. (2001). Parental involvement and students' academic achievement: A meta-analysis. *Educational Psychology Review*, 13(1), 1-22. doi:10.1023/A:1009048817385
- Fernández-Alonso, R., Álvarez-Díaz, M., Suárez-Álvarez, J., & Muñiz, J. (2017). Students' achievement and homework assignment strategies. *Frontiers in Psychology*, 8, 286. doi: 10.3389/fpsyg.2017.00286
- Fernández-Alonso, R., & Muñiz, J. (2011). Diseños de cuadernillos para la evaluación de competencias básicas [Booklet designs for the evaluation of basic skills]. *Aula Abierta*, 39(2), 3-34.
- Fernández-Alonso, R., Suárez-Álvarez, J., & Muñiz, J. (2012). Imputación de datos perdidos en las evaluaciones diagnósticas educativas [Imputation methods for missing data in educational diagnostic evaluation]. *Psicothema*, 24, 167-175.
- Fernández-Alonso, R., Suárez-Álvarez, J., & Muñiz, J. (2014). Tareas escolares en el hogar y rendimiento en matemáticas: una aproximación multinivel con estudiantes de enseñanza primaria [Homework and academic performance in mathematics: A multilevel approach with primary school student]. *Revista de Psicología y Educación*, 9(2), 15-30.
- Fernández-Alonso, R., Suárez-Álvarez, J., & Muñiz, J. (2015). Adolescents' homework performance in mathematics and science: Personal factors and teaching practices. *Journal of Educational Psychology*, 107, 1075-1085. doi: 10.1037/edu0000032
- Fernández-Alonso, R., Suárez-Álvarez, J., & Muñiz, J. (2016). Homework and performance in mathematics: The role of the teacher, the family and the student's background. *Revista de Psicodidáctica*, 21, 5-23. doi: 10.1387/RevPsicodidact.13939
- Gonida, E. N., & Cortina, K. S. (2014). Parental involvement in homework: Relations with parent and student achievement-related motivational beliefs and achievement. *British Journal of Educational Psychology*, 84(3), 376-396. doi: 10.1111/bjep.12039
- Grolnick, W. S., & Slowiaczek, M. L. (1994). Parents' involvement in children's schooling: A multidimensional conceptualization and motivational model. *Child Development*, 65, 237-252. doi: 10.1111/j.1467-8624.1994.tb00747.x
- Hagger, M., Sultan, S., Hardcastle, S. J., & Chatzisarantis, N. L. (2015). Perceived autonomy support and autonomous motivation toward mathematics activities in educational and out-of-school contexts is related to mathematics homework behavior and attainment. *Contemporary Educational Psychology*, 41, 111-123. doi:10.1016/j.cedpsych.2014.12.002
- Haladyna, T. M., & Rodríguez, M. C. (2013). *Developing and validating test items*. New York: Routledge.
- Hill, N. E., & Tyson, D. F. (2009). Parental involvement in middle school: A meta-analytic assessment of the strategies that promote achievement. *Developmental Psychology*, 45(3), 740-763. doi: 10.1037/a0015362
- Hoover-Dempsey, K. V., Battiato, A. C., Walker, J. M. T., Reed, R. P., DeJong, J. M., & Jones, K. P. (2001). Parental involvement in homework. *Educational Psychologist*, 36, 195-209. http://dx.doi.org/10.1207/S15326985EP3603_5
- Jeynes, W. H. (2003). A meta-analysis: The effects of parental involvement on minority children's academic achievement. *Education and Urban Society*, 35(2), 202-218. doi: 10.1177/0013124502239392
- Jeynes, W. H. (2005). A meta-analysis of the relation of parental involvement to urban elementary school student academic achievement. *Urban Education*, 40(3), 237-269. doi: 10.1177/0042085905274540
- Jeynes, W. H. (2007). The relationship between parental involvement and urban secondary school student academic achievement. A meta-analysis. *Urban Education*, 42(1), 82-110. doi: 10.1177/0042085906293818
- Jeynes, W. H. (2012). A meta-analysis of the efficacy of different types of parental involvement programs for urban students. *Urban Education*, 47(4), 706-742. doi: 10.1177/0042085912445643
- Jeynes, W. H. (2016). A meta-analysis: The relationship between parental involvement and African American school outcomes. *Journal of Black Studies*, 47(3), 195-216. doi: 10.1177/0021934715623522
- Katz, I., Kaplan, A., & Buzukashvily, T. (2011). The role of parents' motivation in students' autonomous motivation for doing homework. *Learning and Individual Differences*, 21(4), 376-386. doi: https://doi.org/10.1016/j.lindif.2011.04.001
- Ministerio de Educación (2011). *Evaluación General de Diagnóstico 2010. Educación Secundaria Obligatoria. Informe de resultados* [General Diagnostic Assessment 2010. Compulsory Secondary Education. Results report]. Madrid: Instituto de Evaluación. Retrieved from <http://www.mecd.gob.es/dctm/ievaluacion/informe-egd-2010.pdf?documentId=0901e72b80d5ad3e>
- Mislevy, R. J., Beaton, A. E., Kaplan, B., & Sheehan, K. M. (1992). Estimating population characteristics from sparse matrix samples of item responses. *Journal of Educational Measurement*, 29, 133-161. doi: 10.1111/j.1745-3984.1992.tb00371.x
- Mora, T., & Escardíbul, J. O. (2016). Home environment and parental involvement in homework during adolescence in Catalonia (Spain). *Youth & Society*. doi:10.1177/0044118X15626050
- Moreno, R., Martínez, R., & Muñiz, J. (2015). Guidelines based on validity criteria for the development of multiple choice items. *Psicothema*, 27, 388-394. doi:10.7334/psicothema2015.110
- Murillo, F. J. (2007). School effectiveness research in Latin America. En T. Townsend (Ed.), *International Handbook of School Effectiveness and Improvement* (pp. 75-92). Nueva York: Springer.
- Núñez, J. C., Suárez, N., Rosário, P., Vallejo, G., Valle, A., & Epstein, J. L. (2015). Relationships between perceived parental involvement in homework, student homework behaviors, and academic achievement: Differences among elementary, junior high, and high school students. *Metacognition and Learning*, 10(3), 375-406. doi: 10.1007/s11409-015-9135-5
- OECD (2009). *PISA Data Analysis Manual: SPSS*, 2nd Ed. Paris: OECD Publishing. doi: <http://dx.doi.org/10.1787/9789264056275-en>
- OECD (2014). *PISA 2012 Technical report*. Paris: OECD Publishing. Retrieved January 25, 2016, from: <http://www.oecd.org/pisa/pisaproducts/PISA-2012-technical-report-final.pdf>
- Patall, E. A., Cooper, H., & Robinson, J. C. (2008). Parent involvement in homework: A research synthesis. *Review of Educational Research*, 78(4), 1039-1101. doi: 10.3102/0034654308325185
- Pomerantz, E. M., Moorman, E. A., & Litwack, S. D. (2007). The how, whom, and why of parents' involvement in children's academic lives: More is not always better. *Review of Educational Research*, 77(3), 373-410. doi: 10.3102/003465430305567
- Raudenbush, S. W., Bryk, A. S., Cheong, Y. F., & Congdon, R. T. (2004). *HLM6: Hierarchical Linear and Nonlinear Modeling*. Chicago: Scientific Software International.
- Rodríguez, S., Piñero, I., Gómez-Taibo, M. L., Regueiro, B., Estévez, I., & Valle, A. (2017). An explanatory model of maths achievement: Perceived parental involvement and academic motivation. *Psicothema*, 29(2), 184-190. doi: 10.7334/psicothema2017.32
- Scheerens, J. (2016). *Educational effectiveness and ineffectiveness. A critical review of the knowledge base*. Dordrecht: Springer. doi:10.1007/978-94-017-7459-8
- Scheerens, J., Witziers, B., & Steen, R. (2013). A meta-analysis of school effectiveness studies. *Revista de Educación*, 361, 619-645. doi: 10.4438/1988-592X-RE-2013-361-235
- Sénéchal, M., & Young, L. (2008). The effect of family literacy interventions on children's acquisition of reading from kindergarten

- to grade 3: A meta-analytic review. *Review of Educational Research*, 78(4), 880-907. doi: 10.3102/0034654308320319
- Solís-Salazar, M. (2015). The dilemma of combining positive and negative items in scales. *Psicothema*, 27, 192-200. doi: 10.7334/psicothema2014.266
- Suárez, N., Fernández, E., Cerezo, R., Rodríguez, C., Rosário, P., & Núñez, J. C. (2012). Tareas para casa, implicación familiar y rendimiento académico [Homework, parental involvement and academic performance]. *Aula Abierta*, 40(1), 73-84.
- Suárez-Álvarez, J., Fernández-Alonso, R., & Muñiz, J. (2014). Self-concept, motivation, expectations and socioeconomic level as predictors of academic performance in mathematics. *Learning and Individual Differences*, 30, 118-123. <http://dx.doi.org/10.1016/j.lindif.2013.10.019>
- Trautwein, U., & Lüdtke, O. (2009). Predicting homework motivation and homework effort in six school subjects: The role of person and family characteristics, classroom factors, and school track. *Learning and Instruction*, 19, 243-258. doi: 10.1016/j.learninstruc.2008.05.001
- Valle, A., Pan, I., Regueiro, B., Suárez, N., Tuero, E., & Nunes, A. R. (2015). Predicting approach to homework in Primary school students. *Psicothema*, 27(4), 334-340. doi: 10.7334/psicothema2015.118
- von Davier, M., González, E., & Mislevy, R. J. (2009). What are plausible values and why are they useful? *IERI Monograph Series. Issues and Methodologies in Large-Scale Assessments*, 2, 9-36. Retrieved from http://www.ierinstitute.org/fileadmin/Documents/IERI_Monograph/IERI_Monograph_Volume_02.pdf
- Wilder, S. (2014). Effects of parental involvement on academic achievement: A meta-synthesis. *Educational Review*, 66(3), 377-397. doi: 10.1080/00131911.2013.780009
- Wu, M. L., Adams, R. J., Wilson, M. R., & Haldane, S. A. (2007). *ACER ConQuest 2.0: Generalised item response modelling software*. Camberwell, Victoria: Australian Council for Educational Research.
- Xu, J., & Wu, H. (2013). Self-regulation of homework behavior: Homework management at the secondary school level. *The Journal of Educational Research*, 106(1), 1-13. doi: 10.1080/00220671.2012.658457