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Parental involvement in homework: Relations with parent and student achievement-related motivational beliefs and achievement

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Background. Parental involvement in homework is a home-based type of involvement in children's education. Research and theory suggest that it is beneficial for learning and achievement under certain conditions and for particular groups of individuals.

Aims. The study examined whether different types of parents' involvement in homework (autonomy support, control, interference, cognitive engagement) (1) are predicted by their mastery and performance goals for their child and their beliefs of the child's academic efficacy, and (2) predict student achievement goal orientations, efficacy beliefs, and achievement. Grade-level differences were also investigated.

Sample. The sample consisted of 282 elementary school (5th grade) and junior high school students (8th grade) and one of their parents.

Methods. Surveys were used for data collection. Structural equation modelling was applied for data analysis.

Results. (1) Autonomy support during homework was predicted by parent mastery goal, parents' control and interference by their performance goal and perceptions of child efficacy, and cognitive engagement as supplementary to homework by parent perceptions of child efficacy. (2) Parental autonomy support, control, and interference were differentially associated with student mastery and performance goal orientations, whereas parent cognitive engagement was associated with student efficacy beliefs. (3) The structural model was the same for elementary and junior high school students but the latent means for a number of variables were different.

Conclusion. Different types of parental involvement in homework were associated with different outcomes with parent autonomy support to be the most beneficial one.

Parental involvement in students' homework has recently received much attention among the researchers in an attempt to better clarify how home-based involvement contributes to student learning and achievement. Homework involvement is a multicomponent construct including both quantitative and qualitative aspects ranging from concrete support to more complex guidance (e.g., providing space and materials for doing the homework, developing rules to avoid distractions, tutoring, and doing the homework with the child). However, associations between parental involvement in homework and achievement as well as achievement-related outcomes are not

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consistently found in the empirical literature (for meta-analyses and reviews, see Fan & Chen, 2001; Hill & Tyson, 2009; Hoover-Dempsey *et al.*, 2001; Patall, Cooper, & Robinson, 2008; Pomerantz, Moorman, & Litwack, 2007). Theory and research suggest that parent involvement in children's homework is beneficial for learning and achievement only under certain conditions and for particular groups of individuals. Several factors have been acknowledged in the literature as critical ones including the type of homework involvement (e.g., autonomy support, interference), the grade level (e.g., elementary vs. middle school students), and the ability of the student (e.g., high vs. low achieving) as well as the subject matter (e.g., language, math).

Despite the acknowledgement of the potentially different academic outcomes related to different types of involvement in students' homework, little research has been conducted to assess achievement-related motivational beliefs such as achievement goal orientations and academic efficacy as either outcomes of involvement or mediators of the relationship between homework involvement and achievement (e.g., Ng, Kenney-Benson, & Pomerantz, 2004; Pomerantz, Ng, & Wang, 2006). Similarly, although a number of reasons have been identified in regard to why parents become involved in their children's homework (see Hoover-Dempsey & Sandler, 1997; Hoover-Dempsey *et al.*, 2001), limited systematic research has been carried out to investigate whether the achievement goals parents espouse for their children (mastery vs. performance) or how parents' perceptions of their children's efficacy affect the way they interact with their children during homework (Pezdek, Berry, & Renno, 2002). Therefore, the central goal of the current study was to investigate the structure of relations among parent goals and beliefs for child's academic efficacy, different types of parental involvement in homework, student achievement goal orientations, efficacy beliefs, and achievement. Further, based on evidence showing that elementary school students benefit more by their parents' involvement in homework compared with older students (Green, Walker, Hoover-Dempsey, & Sandler, 2007; see for review Patall *et al.*, 2008), two grade levels were examined, fifth and eighth, to test whether these relationships are moderated by school grade.

Parental involvement in homework: Different types, different outcomes

In an attempt to summarize what parents do when they get involved in their children's homework, Hoover-Dempsey *et al.* (2001) identified eight general forms of homework involvement ranging from establishing physical and psychological structures for the child's homework performance and provision of general oversight of the homework process to more instruction-related types such as tutoring and working with the student at a cognitive and/or metacognitive and self-regulatory level in order to support the child's understanding. A number of research syntheses including surveys, experimental and interview studies indicate that different forms of parental involvement in homework are associated with different results emphasizing that the key issue is the quality and not the quantity or the frequency of involvement (Balli, Wedman, & Demo, 1997; Fan & Chen, 2001; Hoover-Dempsey *et al.*, 2001; Patall *et al.*, 2008; Pomerantz *et al.*, 2007).

As far as the instruction-related types of involvement are concerned, parents may also substantially differ in what they do and why. For example, parents may promote their children's autonomy allowing them to generate the solutions themselves using scaffolding, may be controlling by exerting pressure on their children using orders, directives, and commands, or may interfere by providing correct answers to

assignments. Beyond the well-documented differentiated outcomes of parent autonomy support versus control in the general literature of parental involvement (e.g., Grolnick & Ryan, 1989; Joussemet, Koestner, Lekes, & Landry, 2005; Karbach, Gottschling, Spengler, Hegewald, & Spinath, 2013; Pomerantz, Grolnick, & Price, 2005), autonomy support and avoidance of interference in the context of homework have been associated with positive outcomes, whereas parent control and direct aid have been shown to be detrimental to learning and achievement (Cooper, Lindsay, & Nye, 2000; Ng *et al.*, 2004). Thus, it is important to know not only why parents get involved in their children's homework, but also why they adopt more or less adaptive forms of homework involvement.

Hoover-Dempsey and Sandler (1997) pointed out and empirically tested later (Green *et al.*, 2007) a number of parent motivators of involvement in homework including parental role construction, parental self-efficacy for helping the child succeed in school, specific child invitations, and perceived time and energy for involvement (see also Hoover-Dempsey *et al.*, 2001). Some other longitudinal studies have focused on the transactional processes between child's achievement and parental practices in homework indicating that prior poor academic performance elicits heightened use of intrusive-support practices such as monitoring (i.e., checking children's homework) and helping (i.e., teaching or guiding a child completing her/his homework) when children do not ask for such assistance. These parental practices in turn may influence the child's subsequent performance depending on a number of variables related either to parents (e.g., parents' emotions during homework) or to students themselves (e.g., successes or failures; Pomerantz & Eaton, 2001; Silinskas, Niemi, Lerkkanen, & Nurmi, 2013; Silinskas, Kiuru, *et al.*, 2013). Our knowledge, however, why parents adopt qualitatively different types of instruction-related involvement in homework such as autonomy support, control, or interference, is still limited, and further research is required.

In regard to the correlates and/or consequences of parental involvement in homework, the research findings are still inconclusive (see, e.g., Fan & Chen, 2001; Hill & Tyson, 2009; Hoover-Dempsey *et al.*, 2001; Patall *et al.*, 2008). The majority of studies have focused on the potential contribution of homework involvement on achievement and yielded mixed findings. A number of moderator variables such as the type of homework involvement as mentioned above, the student age, and ability level or the subject area have been suggested to explain inconsistencies in the empirical literature (Patall *et al.*, 2008). However, as Hoover-Dempsey *et al.* (2001) have succinctly noted 'a solitary emphasis on student achievement is unfortunate' (p. 204) and suggested that parents' involvement in homework should be better examined in regard to more proximal learning outcomes including motivational (e.g., attitudes towards homework and school learning, perceptions of competence), cognitive (e.g., strategy use, planning, etc.), and behavioural aspects (e.g., homework behaviours, study habits, etc.), which ultimately influence student achievement. In their extensive meta-analysis, Patall *et al.* (2008) also acknowledge the importance of studying 'non-achievement measures' such as student attitudes and motivation as mediating variables in the relationship between parent homework involvement and achievement.

The widely acknowledged significant contribution of parent styles and general involvement in children's schooling to student motivational beliefs (e.g., Aunola, Stattin, & Nurmi, 2000; Eccles, 2007; Frome & Eccles, 1998; Gonzalez-DeHass, Willems, & Doan Holbein, 2005; Grolnick, Friendly, & Bellas, 2009; Grolnick & Slowiaczek, 1994; Vauras, Salonen, Lehtinen, & Lepola, 2001) has to be further empirically tested in association with different types of parental involvement in homework. In a number of studies, Pomerantz

et al. have indicated that mothers' autonomy support versus control, positive versus negative effect, and mastery-oriented practices in the context of homework were beneficial to children with dysfunctional motivational beliefs (Ng *et al.*, 2004; Pomerantz, Wang, & Ng, 2005; Pomerantz *et al.*, 2006). However, as mentioned above, effects might be dependent on students' age or grade level. Meta-analyses and reviews on parental involvement in children's homework (e.g., Hill & Tyson, 2009; Patall *et al.*, 2008; Pomerantz *et al.*, 2007) have indicated children's age as a moderator variable that could, at least in part, account for the inconsistent results. Elementary and high school students, as compared to middle school students, benefit more by parental assistance in homework and parent involvement decreases as children become older (see also Cooper *et al.*, 2000; Green *et al.*, 2007). Actually, involvement in homework has been the only type of home-based parental involvement that has not been consistently associated with desirable outcomes for middle school students (Hill & Tyson, 2009). Several explanations have been provided for the grade-level differences including the lack of skill and study habits for elementary school children, the need for very specialized assistance to high school students which many parents may lack, and the achievement and motivational decline during the middle school years (Hill & Tyson, 2009; Patall *et al.*, 2008; Pomerantz *et al.*, 2007).

Parent achievement goals and academic efficacy beliefs for their children

Achievement goal theory has been very influential among theorists and researchers in their attempt to explain why students engage in academic behaviours. Goal orientations represent the purposes for engaging in achievement-related behaviours that affect the direction, the effort, and the quality of student investment. Traditionally, two main types of goal orientations have been acknowledged in the literature, mastery and performance, associated with different cognitive, affective, and behavioural patterns of learning. An orientation towards mastery is defined as an orientation towards developing one's competence via a focus on understanding and skill acquisition, whereas an orientation towards performance is an orientation towards demonstrating one's competence or avoiding the demonstration of lack of competence via a focus on gaining favourable judgments and higher school grades compared with others or on avoiding unfavourable judgments (for reviews, see, e.g., Ames, 1992; Elliot, 2005; Kaplan, Middleton, Urdan, & Midgley, 2002). As a social cognitive theory, achievement goal theory asserts that goal orientations become part of a student's life within contexts such as the school and the family (Maehr, 2001). The role of the school in goal adoption has been widely confirmed in the past research (e.g., Ames, 1992; Church, Elliot, & Gable, 2001; Patrick, Ryan, & Kaplan, 2007; Urdan & Midgley, 2003), whereas parents' role has been less examined. The limited evidence on parent goals has indicated that when students perceive an emphasis on mastery by their parents, they are more likely to adopt mastery goal orientation and, in turn, show adaptive learning outcomes such as engagement in the classroom and positive coping following a bad experience in school. On the contrary, a perceived emphasis on performance by the parents is associated with student performance goal orientation (approach and avoidance) and mostly to null outcomes or less adaptive ones such as denial or projective coping and non-coping when students experience difficulties in school (Friedel, Cortina, Turner, & Midgley, 2007, 2010; Gonida, Voulala, & Kiosseoglou, 2009). However, although parent goals or children's perceptions of their parent goals have been associated with student goal orientations and directly or indirectly to a number of motivational and achievement outcomes, the potential contribution of parent mastery

and performance goals on the ways parents interact with their children in the context of homework has not been explored to date.

Further, the perceptions parents hold for their children's competence to do their class work and the respective homework (academic efficacy) may also play a role in determining the type of involvement they adopt while assisting their children in homework. In Eccles' expectancy-value theory, parents' child-specific beliefs such as perceptions of child's abilities or expectations for child's achievement have been acknowledged as primary determinants of children's own ability perceptions and performance (see, e.g., Eccles, 2007; Fredricks & Eccles, 2002; Frome & Eccles, 1998). In the context of homework, then, parents who hold positive beliefs about the child's academic efficacy to succeed are more likely to adopt different ways to interact with and provide assistance to their child from those parents with negative beliefs about their child's efficacy.

Overview of the present study and hypotheses

The main goals of this study were the following: (1) to bridge parental involvement in homework with achievement goals either as predictors (at the parent level) or as outcomes (at the student level), (2) to examine how parent perceptions of the child's academic efficacy predict the way they get involved in homework and, in turn, the child's own efficacy beliefs, and (3) to assess the extent that the potential effects of the different types of involvement on student current achievement are indirect via students' own achievement goal orientations and efficacy beliefs. Moreover, the study was designed to test the pattern of relationships among the above variables at two student grade levels (specifically, at grades 5 and 8 representing elementary and junior high school, respectively). The specific grade groups were chosen because, as referred earlier, children's age and grade level have been found as a significant moderator in parental involvement in the context of homework.

Because the content and process of parental involvement is sensitive to the specific educational system as well as to the broader societal beliefs about parents' involvement in children's education and school success, a new self-report measure was developed to capture the different types of Greek parents adopt to get involved in their children's homework. Four types of involvement were found among the Greek parents: (1) autonomy support and promotion of self-regulated learning, (2) control, (3) interference, and (4) cognitive engagement related to schoolwork as supplementary to homework. Consequently, the hypotheses of this study were formulated in regard to these types of involvement.

Based on achievement goal and expectancy-value considerations, we expected parents' mastery goals to positively predict their autonomy support and cognitive engagement during homework and negatively their control and interference (Hypothesis 1). The opposite pattern was expected for parents' performance goals, which were expected to undermine autonomy support and cognitive engagement and increase control and interference practices (Hypothesis 2). Parental beliefs of the child's academic efficacy were assumed to be positively related to autonomy support and cognitive engagement and inversely to control and interference (Hypothesis 3). Parental autonomy support and cognitive engagement were expected to predict student mastery orientation and academic efficacy beliefs (Hypothesis 4), whereas parental control and interference should predict student performance goals while undermining student mastery goals and efficacy beliefs (Hypothesis 5). Students' achievement was hypothesized to be associated

with their mastery and performance goal orientations (Hypothesis 6). The effects of the different types of parental involvement in homework on achievement were expected to be indirect through their influence on students' own achievement goal orientations and efficacy beliefs. These indirect paths should depend on the associations of parental involvement types with student goal orientations and efficacy beliefs (Hypothesis 7). In regard to the potential differences in the structural relationships among the variables under examination between 5th and 8th grade and in the absence of prior evidence, no specific hypothesis was set. Based, however, on general findings in the empirical literature about adolescents' developmental needs and parental involvement during adolescence, on the one hand, parent autonomy was expected to be stronger predictor of adolescents' motivational beliefs and achievement as compared to elementary school children, and, on the other hand, parents should be willing to grant adolescents more autonomy, paired with less control, less interference, and less cognitive engagement during homework (Hypotheses 8a and 8b, respectively).

Method

Participants

The sample included 282 children, and one of their parents (matched sample) almost equally distributed in fifth (N = 140, 74 girls, aged 10–11 years) and eighth graders (N = 142, 78 girls, aged 13–14 years).[1] Among the parents, 224 (79.4%) were mothers and 56 (19.9%) fathers. The majority of parents aged 41–50 years (62.4%) and 31–40 (29.4%), three parents were below 30 (1.1%), and the rest were above 51 years (7.1%). Two parents did not report their gender, and five parents did not report their age. Regarding parental educational level, 38.6% of the fathers and 37% of the mothers had finished senior high school, 34.6% of fathers and 41% of mothers had a university degree, 11.6% of fathers and 10.3 of mothers had a master or doctoral degree. A percentage of 9.1% of fathers and 6% of mothers had not finished high school. The great majority of children lived with both of their parents (89%).

Regarding daily involvement in their child's homework, 59.7% of the parents of 5th graders and 40.1% of the parents of 8th graders reported daily involvement. Chi-square test for independence using the adjusted standardized residuals (d_{ij}; Everitt, 1977) indicated that parents' daily involvement in children's homework was significantly associated with students' grade, $\chi^2(2) = 9.93$, $p < .01$, with parents of the younger students to get involved in their children's homework significantly more than the parents of the high school students. From those parents who reported that they were involved in homework, 85% of the parents of 5th graders and 74.5% parents of the 8th graders were involved 1–2 hr daily with the rest of them to report three and more hours of involvement per day.

Students were recruited from eight public schools located in urban but economically diverse school districts in Northern Greece. Permission by the schools was provided. A total of 417 parents were initially contacted, and their consent for their child's participation was requested. All parents were informed that their child's as well as their own participation was voluntary and that their responses would be treated confidentially. Of the 406 parents who provided their consent (97.36%), 282 completed the

[1] *In the Greek educational system, elementary school lasts 6 years followed by high school, split into junior high (7th–9th grade) and senior high school (10th–12th grade).*

questionnaires (69.35%). The non-respondent parents were almost equally distributed in the two grade levels (56 fifth and 68 eight graders). Analyses were then carried out to compare the achievement of students whose parents returned the questionnaires with the achievement of students whose parents did not return them. Non-significant differences were found between the two groups ($p > .05$). Students were tested in groups during a 45-min regular class period and asked to deliver the parental questionnaire to their parents.

Measures

Parent measures

Parents were asked to complete a set of self-report scales measuring their involvement in students' homework, their achievement goals for their child (mastery and performance), and their perceptions of their child's academic efficacy. The responses were given on a 5-point Likert-type scale for all measures.

Parental involvement in students' homework. We developed a new questionnaire to measure different types of parent's attitudes towards assisting homework based on the relevant literature and existing measures and taking into account the Greek educational context (e.g., Cooper *et al.*, 2000; Hoover-Dempsey *et al.*, 2001; Walker, Wilkins, Dallaire, Sandler, & Hoover-Dempsey, 2005). The scale was developed into four steps. First, 14 parents (12 mothers and two fathers) with different educational background and with children attending different school grades were interviewed in a semi-structured interview about their practices of assisting their children while they work on regular homework. Next, a self-report scale based on the detailed content analysis of the interview data was developed consisting of 53 questions. This scale was then pilot-tested in a sample of 150 parents. Pilot data were analysed using principal component analysis with varimax rotation. Four factors were identified with 33 questions distinctive mayor loadings on one factor: (1) autonomy support and promotion of self-regulation, (2) control, (3) interference, and (4) cognitive engagement related to schoolwork.

In the final step, we replicated the factor structure in an independent sample of 315 parents. The final scale consisting of 30 items was used in this study. *Autonomy Support* consisted of eight items and measured parent involvement in terms of provision of facilitating hints, encouraging children for careful looks in case of mistakes or difficulties, asking for reflecting upon the task and its solution, and promoting self-regulatory practices (e.g., 'When your child is asking for help because s/he cannot solve a problem, how often do you recommend her/him to read the problem from the beginning?', $\alpha = .84$). *Parent Control* consisted of seven items measuring parent continuous checking over mistakes and assuring that all assignments are carried out properly according to the teacher's or book instructions, asking the child to memorize the material and caring to avoid any homework omissions. It should be noted that all control items were framed based on the refined conceptualization of parent control proposed by Grolnick and Pomerantz (2009). Specifically, the items focused on parent pressure, intrusiveness, and dominance in completing school homework and not on guidance and structure provision (e.g., 'How often do you ask your child to tell you the lessons for the next day by heart in order to assure that s/he has learned them properly?', $\alpha = .90$). *Interference* included seven questions measuring parent tendency to solve the child's exercises although

the child has not asked for it or to teach an upcoming lesson in advance (e.g., 'How often do you solve your child's exercises because your child does not want to?', $\alpha = .70$). *Cognitive Engagement* as supplementary to homework included eight items and measured parent involvement aiming to their child's empowerment such as guiding their child to search for extra homework-related information in other books or on the internet, providing further information related to schoolwork or assigning additional exercises similar to schoolwork for practice (e.g., 'How often do you indicate to your child books relevant to school subjects for knowledge enrichment?', $\alpha = .69$).

Parent goals. For this study, two scales from the Patterns of Adaptive Learning Scales (PALS, Midgley *et al.*, 2000) were adjusted so that they were applicable to parents instead of students. One scale measured parent mastery goals for the child (six items, e.g., 'I want my child to understand the concepts, not just do the work', $\alpha = .70$) and the other measured parent performance goals for the child (six items, e.g., 'I would be very pleased if my child would be the only one in her/his class who could answer the teacher's questions', $\alpha = .74$).

Parent perceptions about child academic efficacy. The scale measuring student academic efficacy from PALS (Midgley *et al.*, 2000) was transformed for parents to measure parent perceptions of their child's academic efficacy. One new item was added to the five items of the original scale (e.g., 'I am certain my child can master the skills taught in class this year', $\alpha = .85$).

Student measures

Students were asked to complete self-report scales with a 5-point Likert-type response format measuring their personal achievement goals and their perceived academic efficacy. Their school grades were taken from the school records.

Achievement goal orientations. The respective scales from PALS (Midgley *et al.*, 1998) were used in the study. Although the trichotomous framework for student goal orientations was initially adopted (mastery, performance-approach, and performance-avoidance goals; see Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997), the two performance orientations were highly correlated ($r = .76$) and not clearly distinct as separate factors. Thus, a general performance goal orientation factor consisting of 10 items (e.g., 'I want to do better than other students in my class', 'An important reason I do my classwork is so that I don't embarrass myself', $\alpha = .83$) was used to avoid multicollinearity-related instability in the structural equation modelling step. The scale measuring mastery goal orientation consisted of six items (e.g., 'An important reason why I do my class work is because I like to learn new things', $\alpha = .74$).

Perceived academic efficacy. The PALS scale measuring students' beliefs about their efficacy to do successfully their class work was used (Midgley *et al.*, 2000). As in the parent respective scale, one new item was added to the five items of the original scale (e.g., 'I am certain I can master the skills taught in class this year', $\alpha = .76$).

Achievement. Student achievement was a composite score based on school grades in language and math and was taken from the school records. The use of the composite score instead of subject-specific grades (e.g., math or language) was preferred based on prior evidence, indicating that general achievement indices, as compared to achievement in specific school subjects, are more closely associated with parental involvement in student homework (Fan & Chen, 2001). Due to the different grading system in elementary and junior high school, high school grades (20-point scale) were transformed into the elementary school scale (10-point scale).

Results

Statistical analysis

Hypotheses were tested using structural equation modelling (MPlus 7.1, Muthen & Muthen, 2012). All variables were constructed as latent factors with two indicators. Each indicator consisted of a random set of half of the items (parcelling technique, Little, Cunningham, Shahar, & Widaman, 2002; Matsunaga, 2008). Indicators were treated as tau-equivalent measures of the underlying construct to warrant identification of the measurement model (Lord & Novick, 1968).

The starting model was a full mediation model based on the theoretical assumption that parent goals and beliefs for their child's academic efficacy predict the four types of parent homework involvement which, in turn, predict student goal orientations and academic efficacy beliefs. Achievement was regressed on student goal orientations and efficacy beliefs.

Grade-level differences were tested using multigroup SEM models. MPlus includes mean structure for all observed variables and calculates latent mean difference score and significance tests in multigroup models. Latent mean vector testing was used.

Model 1: Full mediation model

Parent goals and beliefs for child's efficacy were specified to predict the four parent involvement scales (3*4 = 12 paths) which, in turn, were allowed to predict the three student variables, mastery goal orientation, performance orientation, and academic efficacy (4*3 = 12 paths). These variables were specified as the only predictors of achievement (three paths). The model had a very good fit, $\chi^2(222) = 423.77$, $p < .001$, $\chi^2/df = 1.91$, CFI = .933, TLI = .917, RMSEA = .057, SRMR = .064. However, including the measurement part, this model estimated 102 parameters, which is a critical number given our sample size (Kline, 2010). Therefore, we trimmed the model before continuing with subgroup comparisons.

Model 2: Trimmed mediation model

In an iterative process (one at a time), the insignificant paths in the above structural model were removed until all remaining structural regression coefficients were significant (all coefficients with a standardized weight of <.15 were removed, indicating a power threshold for any regression coefficient in the model at $\alpha = .05$). The measurement models were not affected because all factor loadings were highly significant. With 88 free parameters, the model yielded also a good fit, $\chi^2(236) = 444.63$, $p < .001$, $\chi^2/df = 1.88$, CFI = .931, TLI =.919, RMSEA = .056,

SRMR = .07. The correlation matrix of the latent constructs is presented in Table 1, whereas Model 2 is depicted in Figure 1.

In partial support of Hypothesis 1 and Hypothesis 2, parent mastery goal predicted autonomy support positively and interference negatively, whereas parent performance goal predicted interference and control positively. Parent beliefs of child efficacy positively predicted cognitive engagement and negatively control and interference indicating considerable support for Hypothesis 3. Student mastery goal orientation was positively predicted by parent autonomy support and negatively by interference. No significant effect was found for control or cognitive engagement on student mastery goal orientation. Student performance orientation was significantly predicted only by parental control. Student academic efficacy was negatively predicted by interference and positively by cognitive engagement, whereas no significant effect was found for parent autonomy support and control. The above results provide partial support of Hypotheses 4 and 5. In line with the first part of Hypothesis 6, academic achievement was positively predicted by student mastery goal orientation, whereas the (negative) coefficient from student performance orientation was insignificant and small in size providing no support for the second part of Hypothesis 6.

Regarding the indirect paths, the following ones were significant: parent autonomy support was significant mediator between parent mastery goal and student mastery goal orientation ($\beta = .03$, $p < .05$), whereas parent control was marginally significant mediator between parent performance goal and student performance goal orientation ($\beta = .03$, $p = .05$). Parent cognitive engagement and interference significantly mediated the association between parent beliefs of child efficacy and child's own efficacy ($\beta = .07$, $p < .001$ and $\beta = .06$, $p < .05$, respectively). Finally, the relationship between parent autonomy support and achievement was significantly mediated by student mastery goal orientation ($\beta = .06$, $p < .05$).

Model 3: Grade-level differences

To test for differences in the model structure and latent means by grade level, we ran a sequence of nested models with increasing constraints. Chi-square difference testing was used to decide whether the additional constraints caused a significant decline in model fit. We tested two null hypotheses: (1) the structural model is the same for both grade levels; (2) the latent mean scores are identical for both grade levels. Table 2 summarizes the model fit statistics for three models. Model 3.0 constrained the measurement models to be identical, but estimated the latent means and the structural parameters separate for the two grade levels. Model 3.1 constrained the measurement model and the structural model to be the same. Model 3.2 constrained equality of the latent means in addition to the measurement and the structural model.

The chi-square difference test between model 3.0 and 3.1 showed no significant change in fit by imposing equality constraints with respect to the regression coefficients, $\Delta\chi^2 = 31.5$, $\Delta df = 24$, $p > .05$. Therefore, the null hypothesis that the structural model is the same in both grade levels was retained rejecting Hypothesis 8a.

The chi-square difference test between model 3.1 and 3.2, however, was significant, $\Delta\chi^2 = 111.3$, $\Delta df = 11$, $p = .000$, rejecting the null hypothesis that the vector of latent means scores would be identical for both grade levels. Table 3 reports the mean difference for the 11 latent factors and the univariate significance tests. The latent variables are standardized by definition, meaning that the mean difference reflects effect sizes in the sense of Cohen's *d* (Cohen, 1988). The comparisons between the two grade

Table 1. Correlation matrix of the latent constructs

	1	2	3	4	5	6	7	8	9	10
1. Parent mastery goals										
2. Parent performance goals	.146*									
3. Parent beliefs for child's efficacy	.196**	.281**								
4. Parent autonomy support	.253**	−.067	−.048							
5. Parent interference	−.181*	.107	−.301	.227**						
6. Parent control	.104	.080	−.227**	.563**	.456**					
7. Parent cognitive engagement	.134	.066	.188*	.650**	.262**	.478**				
8. Student mastery goal orientation	.000	−.002	.102	.172*	.114	.096	.125			
9. Student performance goal orientation	.057	.147	−.154*	.067	.048	.172**	.081	.339**		
10. Student academic efficacy beliefs	.065	.059	.194**	.232**	−.116	.092	.214**	.665**	.377**	
11. Achievement	.008	.105	.350**	.078	−.426**	−.025	.040	.301**	.016	.289**

Notes. *$p < .05$; **$p < .01$.

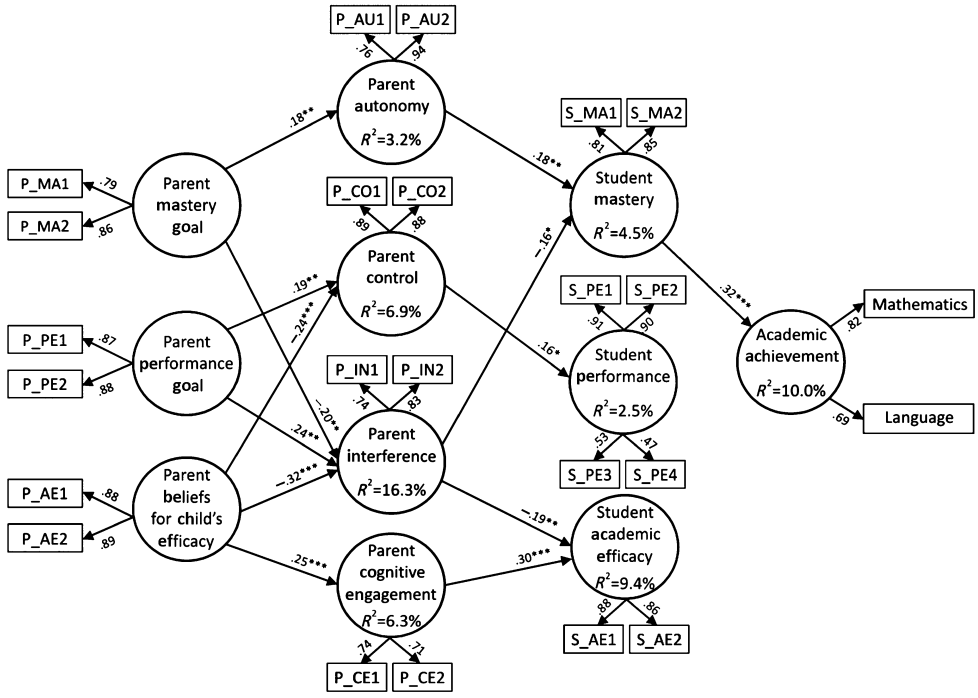

Figure 1. SEM estimates for Model 2. *Note.* *p < .05; **p < .01; ***p < .001. All coefficients are standardized. P, parent; S, student; MA, mastery; PE, performance; AE, academic efficacy; AU, autonomy; CO, control; IN, interference; CE, cognitive engagement.

Table 2. Chi-square difference model test by grade level (5th and 8th grades)

	Model 3.0	Model 3.1	Model 3.2	$\Delta\chi^2$ 3.1–3.0	$\Delta\chi^2$ 3.2–3.1
χ^2	851.0	882.5	993.8	31.5	111.3
$\Delta\chi^2$	509	533	544	24	11
p	<.001	<.001	<.001	>.05	<.001

Notes. Model 3.0: the measurement models constrained to be identical; Model 3.1: the measurement model and the structural model constrained to be the same; Model 3.2: constrained equality of the latent means in addition to the measurement and the structural models.

levels indicated: (1) significantly less parent autonomy support and control for eighth graders, whereas non-significant differences for interference, cognitive engagement, and perceived child efficacy beliefs between parents of elementary and high school students, and (2) significantly lower student motivational variables and achievement for 8th graders as compared to 5th graders. The above results support Hypothesis 8b only in regard to the expected less parental control. Expected increased autonomy, decreased interference, and cognitive engagement were not supported.

The data used in this study were cross-sectional in nature, making the interpretation of model paths as causal problematic, particularly in regard to the association between parental involvement in homework and student achievement (see Pomerantz & Eaton, 2001; Silinskas, Kiuru, *et al.*, 2013; Silinskas, Niemi, *et al.*, 2013). While the above confirmed model is in line with the predicted directionality based on extensive prior

Table 3. Mean differences for all variables between Grade 5 and Grade 8

	Mean difference	*SE*	*t*	*p*
Parent mastery goal	−0.035	0.059	−0.603	.546
Parent performance goals	0.014	0.096	0.149	.882
Parent beliefs for child's efficacy	0.115	0.089	1.287	.198
Parent autonomy support	−0.224	0.078	−2.872	.004
Parent control	−0.765	0.118	−6.485	.000
Parent interference	0.072	0.062	1.172	.241
Parent cognitive engagement	−0.088	0.075	−1.174	.240
Student mastery goal orientation	−0.513	0.092	−5.549	.000
Student performance goal orientation	−0.268	0.144	−1.859	.063
Student academic efficacy	−0.319	0.095	−3.376	.001
Student achievement	−0.333	0.127	−2.621	.009

Notes. Negative scores reflect lower scores for grade 8.

research and theory on parent involvement in homework as well as on goal theory, we ran an alternative model with the paths of the right side of the initially hypothesized structural model reversed. Specifically, in the alternative model, the four types of parent involvement in homework were specified not as predictors of student goal orientations, efficacy beliefs, and achievement as in Model 2, but rather as outcome predicted by a number of parent variables (parent goals and beliefs for child's efficacy as in Model 2) as well as by student variables (student goal orientations, efficacy beliefs, and current achievement, reversed paths). The model fit statistics were almost equally good with the originally hypothesized model (Model 2), $\chi^2(211) = 370.28$, $\chi^2/df = 1.75$, $p < .001$, CFI = 943, TLI = .931, RMSEA = .053, SRMR = .063. However, all paths from student variables to the four types of involvement in homework were insignificant with the path from achievement on parent interference being the exception ($\beta = -.41$, $p < .001$).

Discussion

The study focused on the different types of parents' practices while assisting their children in homework. Based on parents' interviews and prior research, a new self-report measure was developed which delineated four different types of instruction-related involvement Greek parents adopt in the context of children's homework: (1) autonomy support and promotion of self-regulation, (2) control, (3) interference, and (4) cognitive engagement related to homework. Overall, the findings of the study indicate that the above types of parent homework involvement are triggered by different factors and differentially associated with student outcomes such as achievement goal orientations, efficacy beliefs, and achievement.

Why parents adopt different types of involvement in children's homework? The contribution of parent goals, beliefs of child's academic efficacy, and the role of achievement

In an attempt to investigate the 'why' aspect of adopting one or another type of homework involvement, which could be more or less beneficial ones, our results indicated that both parent goals for the child's achievement and parent beliefs about

child academic efficacy do matter in what type of involvement they will adopt in the context of homework. Parent goals seem to explain an additional portion of the variance of homework involvement in a way that is consistent to theory and research stemming from achievement goal theory (e.g., Ames, 1992; Elliot, 2005; Kaplan *et al.*, 2002). Specifically, the contribution of parental emphasis on mastery is beneficial, whereas parental emphasis on performance and social comparison is not (see also Friedel *et al.*, 2007, 2010; Gonida *et al.*, 2009; Pomerantz *et al.*, 2006). Autonomy support as a way of parent–child interaction is fully compatible with deep understanding and skill acquisition that mastery-oriented parents encourage. In the context of homework, it might be the best way for parents to substantiate their mastery beliefs and goals into practice 'in front of their child's eyes' which, in turn, predict the adoption of mastery goals by the child her/himself. At the same time, parent mastery goals function as a protective factor for avoiding an interfering style of involvement which would, in turn, undermine student mastery goal orientation and efficacy beliefs. On the contrary, parent performance goals function as risk factors for adopting less adaptive homework involvement types such as control and interference, because these are associated with student increased orientation towards performance and favourable judgments, or decreased orientation towards mastery and low academic efficacy beliefs, respectively.

Furthermore, the lower the beliefs parent hold for their child the more controlling and interfering style adopt during homework and, in turn, the less efficacious children believe they are in the academic domain. On the contrary, parent interference and control are less likely to occur when parents hold positive academic efficacy beliefs for their child, while at the same time, parents are more likely to encourage cognitive engagement as supplementary to homework and, in turn, high efficacy beliefs to their children. Actually, parent cognitive engagement related to homework was only predicted by parents' beliefs about their child academic efficacy. That is, parents decide to involve themselves in their child's homework in a way that takes the child beyond the exact demands of the homework assignments and advance her/his intellectual enrichment only if they believe that their child will effectively cope with these extra demands. The significant role of parent beliefs for child's academic skills on children motivation and behaviour has been acknowledged in the literature (see, e.g., Eccles, 2007; Fredricks & Eccles, 2002; Frome & Eccles, 1998). The findings of the present study further illuminate their role in the context of student homework indicating that low parent efficacy beliefs for their child may have detrimental effects in terms of how parents involve themselves in their child's homework and, in turn, to her/his own academic efficacy beliefs.

Although the model depicting the relationships among the variables under examination was based on extensive prior theory and research, some recent studies have emphasized the interactive processes between child's achievement and parental practices in homework along time (Pomerantz & Eaton, 2001; Silinskas, Kiuru, *et al.*, 2013; Silinskas, Niemi, *et al.*, 2013). Unfortunately, the cross-sectional nature of our data does not allow us to test for these associations. With the limitation of having concurrent measures for all variables, however, the alternative model which was tested indicated that when student goals, efficacy beliefs, and achievement were tested as potential predictors of the different types of parent involvement in homework, none of these student variables predicted parent involvement with only one exception. Academic achievement predicted parent interference negatively indicating that child's poor achievement may also elicit this maladaptive type of parent homework involvement in addition to parent goals and beliefs for child's efficacy discussed above. Further,

achievement was not associated with any of the other parent homework-related practices (autonomy, control, and cognitive engagement) suggesting that the 'evocative impact' of child's achievement on parent homework-related practices (Silinskas, Niemi, *et al.*, 2013) would be more salient in the case of poor achievers (see also Pomerantz & Eaton, 2001). Acknowledging the limitations of the cross-sectional study in drawing causal inferences, more research is required to further explore the above finding. The idea of 'evocative impact' is challenging and has been recently advanced by Nurmi *et al.* both at the level of parent–child relationship and at the level of teacher–student relationship (e.g., Nurmi, 2012; Nurmi, Viljaranta, Tolvanen, & Aunola, 2012; Silinskas, Leppänen, Aunola, Parrila, & Nurmi, 2010; Silinskas, Kiuru, *et al.*, 2013; Silinskas, Niemi, *et al.*, 2013).

Benefits and costs of the different types of parental involvement in homework

The advantages of parental autonomy support versus parental control have been recently empirically tested (Cooper *et al.*, 2000; Ng *et al.*, 2004), and several potential explanatory factors have been proposed such as child skill development, competence beliefs enhancement, and motivational development (see Pomerantz *et al.*, 2007). The results of the present study are in line with this evidence indicating that autonomy support is the only way of parent homework involvement to achievement. Autonomy-supportive parents promote student motivational development in the form of mastery goals and skill acquisition resulting in better achievement. Parental control, defined as practices, characterized by pressure, intrusiveness, and dominance but not by structure and guidance, were only associated with student performance goal orientation (for the detailed discussion on the refinement of parental control, see Grolnick & Pomerantz, 2009). The more or less adaptive nature of performance goal orientation has been widely discussed in the achievement goal theory literature due to the plethora of inconsistent findings ranging from positive to negative and non-significant ones for a number of outcomes and for different age groups of students (see Midgley, Kaplan, & Middleton, 2001). Beyond the inconsistent findings, however, an orientation towards performance has been generally considered as less desirable than an orientation towards mastery. In previous studies in the Greek educational context, performance orientations, approach and avoidance, have been found either very weak or non-significant contributors to student behavioural and emotional engagement in the classroom (see, e.g., Gonida, Kiosseoglou, & Voulala, 2007; Gonida *et al.*, 2009). Similarly, achievement in the present study remained unrelated to performance goal orientation. We should be cautious, however, because performance-approach and performance-avoidance goal orientation, although planned in our initial design, were not used as separate constructs for statistical reasons and the absence of association between an orientation towards performance and achievement could be attributed to the mixed construct of performance goal orientation. Similarly with our results, however, performance-approach and performance-avoidance goal orientations were not distinguished in a recent study by Bong, Woo, and Shin (2013). The authors argued that that the two components of performance goal orientations 'might be too closely intertwined to be separated' (p. 484) especially in very competitive contexts where normative competence and validation of ability are emphasized. The discussion on the separation of performance-approach and performance-avoidance orientations or whether students distinguish these two performance components has recently returned in the literature (e.g., Bong *et al.*, 2013; Murayama, Elliot, & Yamagata, 2011), and further research is certainly needed towards this direction.

Parental control and interference were triggered by the same factors (parent performance goals and beliefs about the child's academic efficacy) but resulted in different outcomes. In order parents to assure their child's good performance, especially when they hold non-positive beliefs about her/his academic efficacy, adopt a more controlling and intrusive type during homework which promotes the child's orientation towards performance but, unfortunately for the parents, not her/his achievement. Parents may also adopt an interfering type of involvement giving the message of low trust to their child regarding her/his efficacy to complete homework, to deal effectively with the academic challenges, and to strive towards skill acquisition. Parental interference to homework seems to be the worst type of involvement in homework functioning via two channels: first, by undermining mastery goal orientation and, second, by lowering child's academic efficacy beliefs (see also, Cooper *et al.*, 2000; Patall *et al.*, 2008). Parents' controlling behaviour during homework was not found to have any negative effects on these two variables, although they neither had any positive effects. It is worth noting that the results of the present study do not provide us with any distinctive parental factors underlying the decision to choose a more controlling or a more interfering style of involvement and future research is needed towards this direction. The only predictor of parental interference but not of parental control was the child's achievement as was found by the alternative model discussed earlier (see also Pomerantz & Eaton, 2001; Silinskas, Niemi *et al.*, 2013).

Parental cognitive engagement resulted in child's increased academic efficacy beliefs, which, however, were not found to be associated with achievement. This type of cognitive engagement was conceptualized as related to homework and not as a general type of intellectual involvement although it might contribute to it. Grolnick and Slowiaczek (1994), in their multidimensional model for parent involvement in children's schooling, have designated cognitive/intellectual involvement as exposure to stimulating activities and materials which promotes children's cognitive development and brings home and school closer. The context of children's homework does bring school and home closer. Moreover, it provides parents with the opportunity to enrich children's academic experiences, knowledge and skills and, in turn, to contribute to their academic efficacy beliefs in a more flexible and less direct way compared with other types of parental involvement. The message of confidence parents communicate with their children by asking them to work beyond the exact homework is probably the key mechanism behind this process (see Fredricks & Eccles, 2002; Fredricks & Eccles 2005).

Does student school grade matter?

The last aim of the study was to examine potential differences in parental homework involvement during elementary and junior high school years. The results of the present study indicated the same structural model for both 5th and 8th grade levels, but not identical mean scores for some of the latent variables. Specifically, parent autonomy support and control during homework decreased in 8th graders, whereas parent interference and cognitive engagement remained the same. The decrease in autonomy support and control may be due to a general decline of parental involvement in children's education (e.g., Eccles & Harold, 1996; Hoover-Dempsey & Sandler, 1997) and the acknowledgement on behalf of the parents that even autonomy support as a way to get involved in homework mismatches adolescents' striving for independence from them. It could be also related to the increased academic demands of junior high school which require specialized assistance from parents, not always available, however

(see Patall *et al.*, 2008). For parent interference in homework, it is likely that some parents believe that this is 'the good way' to help their children and are not aware of the negative consequences of this maladaptive type of homework involvement. Based on the results of the present study, parents who espouse low mastery but high performance goals for their child and hold beliefs that their child is not capable to succeed in school without their involvement (see Eccles & Harold, 1996) are more likely to remain interfering during homework especially if the child is a poor achiever (see Pomerantz & Eaton, 2001). In a similar vein, parents who intellectually engage their elementary school children during homework they do so in high school, as well. Their beliefs that homework is a great opportunity for children's intellectual advancement combined with their confidence in child's potential to succeed could explain why parents who adopt this type of involvement continue to do so as their children progress in school.

Limitations and future research

While our data come from both parents and children representing two age/grade levels, at least four limitations of the current study should be considered. First and as already said many times, the cross-sectional nature of the data does not allow us to draw causal inferences. Longitudinal studies involving parents and children would allow us to draw such conclusions because they would let us clarify whether parent types of homework change over time as their children get older, in what direction and with what cost or benefit. Moreover, the 'evocative impact' of student characteristics including achievement on parental homework-related practices can only be sufficiently studied with longitudinal data. Secondly, although the parent homework involvement questionnaire was developed via an interviewing bottom-up process and attempted to capture not only the frequency but the qualitative characteristics of the parent–child interaction during homework, the traditional flaws related to self-report measures characterize the present study, as well. Online observational methods would further enable us to see whether and how parents change their style of homework involvement across subjects as a function of their own interests, knowledge, and skills, as well as a function of the child's interests, knowledge, and skills. Thirdly, although the sample of the parents included both mothers and fathers, their non-equal distribution did not allow us to test for potential differences in the way mothers and fathers interact with their child in the context of homework. On the other hand, mothers get more involved in students' school life including involvement in homework (e.g., Pleck, 1997), and the sample of the study is indicative of this fact. Fourth, the findings of the present study represent a particular educational context with a strong emphasis on achievement as a source of academic success. Parents are expected to get involved in children's homework, although frequently in non-adaptive ways such as substituting the teacher her/himself, whereas the sources for parent guidance in this endeavour are very limited.

Conclusions

The present study attempted to shed further light on parent involvement in children's homework during elementary and junior high school by examining qualitatively different types of parental involvement such as autonomy support, control, interference, and cognitive engagement as supplementary to homework. The main findings could be summarized as follows: first, autonomy support was found to be the most beneficial

type of parental involvement in homework, whereas interference the most detrimental one. Parental control was less adaptive as well, but not as consistently detrimental. Parental cognitive engagement as supplementary to homework was a positive type of involvement, albeit not in terms of achievement. Secondly, the results of the present study indicated that different types of parental involvement in homework were not only shaped by the achievement goals parents espouse for their child but, at the same time, shaped the child's goal orientations. The same holds true for parent and child academic efficacy beliefs as mediated by involvement types.

The above findings advance our knowledge about the reasons parents adopt particular types of involvement in children's homework as well as about the outcomes of different types of involvement. Further, they offer new insights to parents and caregivers seeking to become effectively involved in children's homework, as well as to school psychologists for parent consultation regarding involvement in children's school lives and, in particular, involvement in homework.

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