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Predicting different types of parental involvement in children's homework: the role of parent motivational beliefs and parent affect

Konstantina Falanga[1] · **Eleftheria Gonida**[1] · **Dimitrios Stamovlasis**[2]

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Abstract
This study investigated motivational and affective processes behind qualitatively different parental involvement practices in children's homework. Parent motivational beliefs (achievement goals, efficacy beliefs for their children, self-efficacy beliefs) were examined as predictors of parent autonomy support, control and interference, and parent positive and negative affect as mediators between motivational and behavioral parental variables. A total of 807 5th Grade children and one of their parents participated in the sample. Structural equation modeling was utilized for data analysis. The results showed that mastery goals predicted positively autonomy support and negatively interference, whereas performance goals predicted controlling practices positively. Parent beliefs of children's efficacy predicted negatively all three parental involvement practices, and parent self-efficacy beliefs positively predicted autonomy support and control. Both positive and negative affect predicted control and interference positively and mediated the relationship between parents' efficacy beliefs and controlling practices. The results indicate the importance of examining relationships among motivational, affective and behavioral parental variables toward a better understanding of parental homework involvement quality.

Keywords Math homework · Parent affect · Parent efficacy beliefs · Parent goals · Parental involvement

For almost two decades, parental involvement in children's homework has been a subject of inquiry among researchers who acknowledged its contribution to children's learning and educational outcomes (e.g., Grolnick & Slowiaczek, 1994; Hoover-Dempsey & Sandler, 1995, 1997; Ma et al., 2016). However, contradictory evidence has been reported and the need for further investigation in the field has been acknowledged (Hill & Tyson, 2009; Moroni et al., 2015; Patall et al., 2008). In general, there has been a recent shifted attention

✉ Konstantina Falanga
kfalanga@psy.auth.gr

[1] School of Psychology, Aristotle University of Thessaloniki, Thessaloniki, Greece

[2] School of Philosophy and Education, Aristotle University of Thessaloniki, Thessaloniki, Greece

toward the qualitative aspects of parental involvement in homework instead of the quantitative ones. These qualitatively different involvement practices have been mainly examined in relation to their consequences on children's learning and achievement (e.g., Barger et al., 2019; Boonk et al., 2018; Xu et al., 2018; Zhou et al., 2020) and much less in relation to the reasons behind their adoption (e.g., Gonida & Cortina, 2014; Katz et al., 2011; Wei et al., 2019).

Few studies have explored the relationships among parental involvement practices, motivational beliefs, and affect (e.g., Pomerantz & Eaton, 2001; Pomerantz et al., 2005; Silinskas et al., 2015) and even fewer have examined parent motivational and affective variables as predictors of distinct parental homework involvement practices (e.g., Gonida & Cortina, 2014; Katz et al., 2011; Tunkkari et al., 2021). The present study aims to investigate why parents adopt qualitatively different types of involvement in their children's homework, such as autonomy supportive or controlling ones. Given that qualitatively different involvement practices have been associated with different student outcomes (e.g.,Dumont et al., 2014; Silinskas & Kikas, 2019; Silinskas et al., 2015), the reasons behind distinct ways of getting involved in homework is worth examining. Building on previous research, parents' motivational beliefs such as their achievement goals for their child and their beliefs for their child's efficacy (Gonida & Cortina, 2014; Mageau et al., 2016) as well as parents' own efficacy beliefs in relation to their children's educational outcomes (Green et al., 2007; Katz et al., 2011; Wei et al., 2019) were examined as predictors of parental homework involvement. Further, positive and negative affect parents usually experience while involving in homework (DiStefano et al., 2020; Pomerantz et al., 2005; Silinskas et al., 2015; Tunkkari et al., 2021) were also examined as potential mediator between parents' motivational beliefs and different involvement practices.

Parental involvement in children's homework

Parental involvement in homework as a multidimensional home-based type of involvement in children's school life involves a variety of parents' behaviors ranging from pragmatic support (e.g., rule-setting and provision of materials for the homework) to tutoring and guidance (e.g., doing homework together) (e.g., Gonida & Cortina, 2014; Dumont et al., 2014; Hoover-Dempsey et al., 2001; Zhou et al., 2020). Parental homework involvement practices have been frequently investigated relying on Self-Determination Theory (SDT) (Ryan & Deci, 2000, 2017) and include autonomy-supportive and controlling practices (Dumont et al., 2014; Moroni et al., 2015; Pomerantz et al., 2007; Silinskas et al., 2015; Trautwein & Ludtke, 2009; Viljaranta et al., 2018). Autonomy-supportive are those parental practices that encourage and support children's independent and responsible work during homework, whereas controlling practices include parents' pressure usually expressed as commands or directives that regulate children's homework behavior (Ng et al., 2004; Pomerantz & Eaton, 2001; Pomerantz et al., 2007). Controlling practices provided during homework have been distinguished into help and monitoring. Parents' help is defined as offering direct teaching, instruction and guidance to children with respect to teacher-assigned activities and monitoring as checking children's homework to ensure whether it is complete and correct (Pomerantz & Eaton, 2001; Pomerantz et al., 2005, 2006; Silinskas et al., 2013, 2015; Viljaranta et al., 2018). Pomerantz and Eaton (2001) conceptualized both help and monitoring as intrusive if they are provided when the child does not ask for them. Silinskas and his colleagues (Silinskas et al., 2013, 2015; Viljaranta et al., 2018) suggested that help and monitoring should not be conceptualized as intrusive types but as

types which differ from each other on the degree of parents' direct involvement. Thus, help is associated with high levels of direct involvement (e.g., parents work together with the child on school assignments) and monitoring with lower levels (e.g., parents assure that homework is done).

In the context of the present study, we suggest that help may be further differentiated depending on the qualitative characteristics of its provision by parents. Specifically, help may be provided in a controlling way (e.g., making sure that the child learns according to instructions), in an interfering way (e.g., offering ready-made answers or solutions to tasks), or even in an autonomy-supportive way (e.g., promoting self-regulated learning). Moreover, help may be provided upon child's invitation, as well. Thus, help may not always be theorized as a controlling practice, but as a type which includes qualitatively different practices ranging from autonomy granting to interference. Interference besides high levels of involvement (Spera, 2005), describes taking charge of homework assignments in a way that undermines children's initiative, skill development, and motivational growth (Gonida & Cortina, 2014; Patall et al., 2008). On the other hand, autonomy support includes provision of help to children (Cooper et al., 2000; Pomerantz et al., 2007; Tunkkari et al., 2021), but in a way that transfers the responsibility for learning to the child and fosters self-regulated learning. For example, Moè et al. (2018) proposed that autonomy support could be conceptually approached as motivational scaffolding practices which denote parents' provision — in a non-intrusive manner — of the smallest amount of help and structure children need to perform their homework autonomously. Few years earlier, the Gonida and Cortina (2014), focusing on the instructional quality of parental homework involvement, conceptualized autonomy support as help provision which includes the promotion of self-regulated learning via facilitating hints, metacognitive strategy use, reflection upon tasks and encouragement of self-monitoring and self-evaluation during assignments.

Despite the conceptual and methodological differences among studies, autonomy-supportive practices have been found as beneficial for children's academic outcomes. Controlling and interfering practices have been generally associated to negative or null outcomes for student learning and achievement (e.g., Gonida & Cortina, 2014; Cooper et al., 2000; Dumont et al., 2014; Moè, et al., 2018; Ng et al., 2004; Pomerantz et al., 2007; Silinskas & Kikas, 2019; Xu et al., 2018). In order to encourage optimal quality of involvement, it is important to understand the 'why' aspect of parents' involvement (Hoover-Dempsey et al., 2001). Still, most research on predictors of parental homework involvement has focused on some of its aspects (e.g., intrusiveness) or employed unidimensional definitions of the concept (Green et al., 2007; Pomerantz & Eaton, 2001; Wei et al., 2019), and only few studies have examined predictors of distinct parental involvement practices (Gonida & Cortina, 2014; Katz et al., 2011; Tunkkari et al., 2021). The current study aimed to shed further light on why parents are involved in more or less adaptive ways in their children's homework by exploring a number of parent motivational beliefs and affect as predictors of autonomy-supportive, controlling and interfering practices.

Parents' motivational beliefs, affect and homework involvement practices

Empirical evidence on parent motivational beliefs as predictors of parental involvement in homework is still limited, although a number of studies and meta-analyses have acknowledged parent educational expectations, goals, values, and perceptions of children's ability

to be autonomous as determinants of parental involvement in children's education and parenting in general (e.g., Boonk et al., 2018; Green et al., 2007; Grolnick, 2015; Hill & Tyson, 2009; Mageau et al., 2016). In relation to homework involvement, parents' motivational beliefs refer, on the one hand, to beliefs concerning their children (e.g., parents' achievement goals for their child, their beliefs for the child's efficacy or perceptions of the child's ability to be autonomous and succeed in school) and, on the other hand, to their own motivational beliefs (e.g., parent role beliefs, efficacy and competence beliefs, autonomous vs controlled motivation for providing help) (Gonida & Cortina, 2014; Katz et al., 2011; Silinskas et al., 2015; Tunkkari et al., 2021; Wei, et al., 2019).

The goals that parents adopt for their children's achievement have been associated to their involvement in homework. In general, links have been evidenced between parents' emphasis on the process of learning, on the one hand, and parental involvement and children's achievement motivation, on the other (Eccles & Harold, 1993; Katz et al., 2011; Moè et al., 2018; Pomerantz et al., 2007; Trautwein & Lüdtke, 2009). Limited evidence in the framework of achievement goal theory has indicated that when parents are oriented toward performance for their children, they tend to adopt controlling and interfering practices (Gonida & Cortina, 2014; Mageau et al., 2016), whereas when they endorse mastery goals for their children, autonomy-supportive practices are more likely and interfering practices are less likely to occur in homework settings (Gonida & Cortina, 2014). It should be noted, however, that the links between the quality of parental involvement in children's homework and parent achievement goals have not yet been systematically examined and more research on their relationship is required. Studies across cultural contexts are also necessary since differences in the educational systems and cultural values (i.e., the value assigned on school success) may impact parents' goal orientations and subsequent homework involvement practices.

Concerning parents' perceptions of children's competence and/or efficacy in school tasks, research findings have shown that, when parents perceive their children as less competent to do their schoolwork autonomously, they tend to provide more direct help and monitoring (Silinskas et al., 2015) or to adopt controlling and interfering practices (Gonida & Cortina, 2014), especially in subjects such as math that are considered challenging for children (Bhanot & Jovanovic, 2005). Parents' negative beliefs about their child's competence to succeed in school may even result in exertion of psychological control (i.e., intrusiveness, pressure, guilt induction, etc.) during the homework involvement process (Tunkkari et al., 2021). On the opposite, when parents trust their child's competence, they tend to provide children with extra learning opportunities for intellectual enrichment purposes (e.g., by encouraging them to search for extra information in books/on the internet, by making available additional material related to school subjects beyond homework, etc.) (Gonida & Cortina, 2014). Further, parents who believe that their child is doing well at school consider themselves, and are also perceived by children, as more autonomy-granting (e.g., providing choice and options) in homework situations (Tunkkari et al., 2021). Although it is suggested that motivational beliefs such as perceptions of competence, ability, and efficacy (Gonida & Leondari, 2011; Bong, 1997), as well as parental homework involvement (Patall et al., 2008; Silinskas & Kikas, 2019; Silinskas et al., 2013), are subject-specific, few studies have focused so far on specific subjects (e.g., math, Bhanot & Jovanovic, 2005) and further research is needed.

Parents' efficacy for helping children succeed in school is conceptualized as their perceived influence over children's learning and school success (Hoover-Dempsey et al., 1992; Walker et al., 2005). Empirical evidence has indicated that parents' efficacy beliefs are a strong positive predictor of home-based involvement including homework involvement

(Green et al., 2007). The more self-efficacious parents are, the higher their involvement in children's home assignments. This is especially true in elementary school when parents are more likely to feel that they possess the necessary knowledge and skills to help with homework challenges (Wei et al., 2019). Further, there is some evidence that parents' efficacy beliefs are associated with optimal parental involvement quality. According to Katz et al. (2011), parents who perceive themselves as competent in helping their children with homework tend to adopt need-supportive involvement practices that satisfy students' basic psychological needs for autonomy, competence, and relatedness. Similarly, other empirical results indicate that the higher parents' self-efficacy is, the more they tend to provide structure, direct assistance, and autonomy support to their children (O'Sullivan et al., 2014).

In addition to their motivational beliefs, parents experience a variety of emotions while engaging in children's homework, both positive such as joy, satisfaction, pride, and negative such as stress, frustration, hopelessness (Pomerantz & Eaton, 2001; Pomerantz et al., 2005, 2007). Parents' positive affective experience is associated to more autonomous reasons for involvement (i.e., pleasure, perceived value) and positive beliefs of children's competence, whereas their negative affect is linked to more controlled reasons (i.e., obligation, guilt) and lack of trust in children's abilities to cope with learning and homework challenges (Grolnick, 2015; Moè & Katz, 2017; Pomerantz & Eaton, 2001; Pomerantz et al., 2005, 2007; Silinskas et al., 2015). Further, parent affect may have an influence on their homework involvement practices (DiStefano et al., 2020; Silinskas et al., 2015; Tunkkari et al, 2021). In a longitudinal study, Silinskas et al. (2015) indicated that mothers' negative affect during homework mediated the association between children's school performance and their perceptions of child's ability to work autonomously and provision of direct help and monitoring. Moreover, recent empirical findings (DiStefano et al., 2020) showed that parents with high math anxiety are more likely to experience negative experiences, including conflicts, in the homework interaction with their children. Finally, mothers who report negative emotions in homework settings, perceive themselves as being psychologically controlling toward their children, whereas mothers' fewer negative and more positive emotions predict more frequent use of autonomy support practices (Tunkkari et al., 2021).

The studies examining parents' motivational beliefs such as achievement goals, beliefs of children's efficacy, and self-efficacy beliefs as potential explanatory factors of the qualitatively different homework involvement practices are still limited. To the best of our knowledge, all three parent motivational beliefs have not been explored in a single study to date. Moreover, co-examining the role of parents' both positive and negative affect with the above motivational variables has not received enough research attention. The present study aims to shed further light toward this direction.

The present study

The present study focused on the underexamined question 'why' parents involve themselves in their children's homework in qualitatively different ways. A number of variables related to parents' motivational and affective processes was co-examined as potential predictors of their involvement in children's homework. Specifically, drawing on previous research findings and gaps, we tested the predictive value of parents' achievement goals (mastery and performance), their beliefs for their child's academic efficacy, their own efficacy beliefs, and their positive and negative affect during homework in relation to qualitatively different involvement practices. Three types of involvement were examined,

namely autonomy support, control, and interference. These practices denote differences in the quality of parental involvement, are driven by alternative parent motivational beliefs and have linked to distinct children's outcomes (e.g., Bhanot & Jovanovic, 2005; Gonida & Cortina, 2014; Katz et al., 2011; Silinskas et al., 2015; Tunkkari et al., 2021). The theoretical model of the study is presented in Fig. 1.

Fifth grade was used in the present study for both contextual and developmental reasons. In Greece, elementary school lasts 6 years and major changes occur at the late elementary school including a significant increase in curriculum difficulty and change from an ABC letter grading to a numeric 10-point scale grading. This change in the evaluation system in combination with the increasing difficulty makes parents focus more on school grades compared to the previous years. Moreover, the development of children's thinking about the relation between ability and effort around this age (Nicholls, 1984) influences their motivation and achievement and may influence parents' goals, beliefs, affect and behavior about their child's learning at school and at home. Thus, it is important to examine parental homework involvement and its predictors in this grade. Further, the theoretical model of the study was examined in relation to mathematics in accordance with the subject-specific approach to homework research (e.g., Silinskas & Kikas, 2019; Trautwein & Lüdtke, 2009; Zhou et al., 2020). Parent involvement in homework may vary among different school subjects due to their different content and perceived difficulty, the prior parent knowledge and skills in different subjects, and the potential conflict between the instructional strategies used at school and home (e.g., O'Sullivan et al., 2014; Patall et al., 2008; Silinskas & Kikas, 2019; Silinskas et al., 2013). Mathematics is a core school subject in all curricula and math performance predicts individuals' academic progress, career opportunities (especially in STEM professions), and financial future (e.g., Rodríguez et al., 2021). Math performance may also be viewed by children and parents as a matter of ability and talent frequently connected to stereotypical beliefs (Bhanot & Jovanovic, 2005; Gladstone et al., 2018). Moreover, learning (and teaching) mathematics involves high cognitive, motivational, and affective demands, whereas high anxiety and avoidance

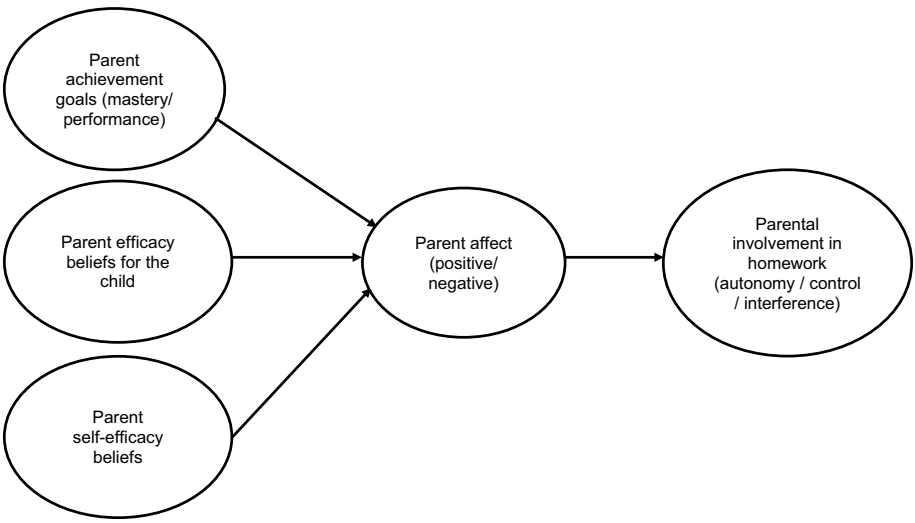

Fig. 1 Schematic model of the associations among parent motivational beliefs, affect and involvement practices in the homework context

behaviors have been associated with it (Buckley et al., 2016; Turner et al., 2002). Thus, investigating parent motivational beliefs and affect behind parental involvement in math homework would further enhance our knowledge about parental behaviors that influence children's motivation and achievement in mathematics.

Grounded on theory and previous research, our hypotheses were formulated as follows. First, parent mastery goals were expected to positively predict autonomy support and inversely control and interference (Hypothesis 1a). The opposite pattern was expected for parent performance goals and their relationship to autonomy support, control, and interference (Hypothesis 1b). Second, parent beliefs of children's efficacy were assumed to predict autonomy support positively and control and interference negatively (Hypothesis 2). Similarly, parental self-efficacy beliefs were expected to be positively associated with autonomy support and negatively with control and interference (Hypothesis 3). Regarding parent positive affect, it was anticipated that autonomy support would be associated with it positively, whereas control and interference negatively (Hypothesis 4a). The reverse pattern of associations was hypothesized for negative affect and the three types of homework involvement (Hypothesis 4b). The effects of parent goals on involvement practices were also expected to be indirect via parent affect, which would depend on the relationships between parent goals and affect (Hypothesis 5). Similarly, parent affect was assumed to mediate the association between parent beliefs for the child's efficacy and involvement practices (Hypothesis 6) as well as between parent efficacy beliefs and practices (Hypothesis 7).

Method

Participants and procedure

A total of 807 Greek parents participated in the study (78.4% mothers, N = 633, one parent did not report gender). All parents had children attending fifth grade (56.4% girls, N = 455). The majority of mothers and fathers had a university or a postgraduate title (55% of mothers, 56% of fathers), whereas very few parents had completed only primary school (1% of mothers, 4% of fathers). The rest of the parents had completed a post-secondary (non-university) educational institution (22% and 9% of mothers and fathers, respectively), senior (18% mothers, 26% fathers) or junior high school (4% of both mothers and fathers).

A stratified random sample participated in the study based on the urban/rural level of the location of the schools. Parents were approached via their children; they were kindly asked to deliver to their parents the questionnaire including the informed consent form describing the purpose and the method of the study. For each child, the parent who was most often involved in her/his child's homework was invited to participate in the study and send back the consent form signed and the completed questionnaire via their child. The great majority of parents reported weekly involvement in their child's math homework (96.4%). The project was approved by the Ethics Committee of the Institute of Educational Policy (Research Section) and entrance permission to the schools was provided by the Ministry of Education.

Measures

All variables under examination were measured using 5-point Likert-type scales. The measure of parental involvement in homework was initially developed in Greek and used in

previous studies (e.g., Gonida & Cortina, 2014). All other scales were translated to Greek using standard and back translation procedures. For the purposes of the present study, all scales were adapted for mathematics. Means and standard deviations, skewness and kurtosis of the corresponding distribution for all measures are presented in Table 1. The percentage of missing data was 4.33%. Each questionnaire is described below.

Parental involvement in children's math homework

The questionnaire is composed of 22 items divided into three subscales measuring three qualitatively different involvement practices during homework, namely autonomy support, control, and interference. Similar to previous studies (Gonida & Cortina, 2014; Silinskas et al., 2015; Tunkkari et al., 2021; Viljaranta et al., 2018), parents reported how often they use specific involvement practices related to the three qualitatively different types under examination. Measuring the frequency of parent behavior is more ecologically valid and reduces social desirability compared to scales measuring parent behaviors as more stable characteristics. Parent autonomy support scale consisted of eight items and assessed parent promotion of the child's self-regulatory practices during homework, such as planning, strategy use, and self-reflection (e.g., providing children with facilitating hints so that they can solve the exercise by themselves, encouraging careful looks in case of mistakes or difficulties, asking for reflecting upon task solutions, etc./e.g., "How often do you advise your child to go back to theory or previous material in order to solve an exercise?"). Parent control scale included seven items measuring parent pressure and dominance in homework completion such as continuous monitoring and checking over mistakes/omissions and assuring that assignments are properly done according to teachers' instructions (e.g., "After your child has finished her/his homework in math, how often do you check whether s/he has done it correctly?"). Parent interference scale comprised seven items measuring parent overinvolvement in homework such as solving the child's exercises even when the child has not asked for it or teaching a school lesson in advance at home (e.g., "How often do you solve a homework exercise that your child cannot solve?). Confirmatory factor analysis demonstrated a good fit for the three-dimensional model: $\chi^2(156) = 300.12$, $p < 0.0001$, $\chi^2/df = 1.92$, CFI = 0.964, GFI = 0.901, NNFI = 0.946, RMSEA = 0.068 (0.056–0.080), SRMR = 0.078. Cronbach's *alpha* reliability values were $\alpha = 0.81$, $\alpha = 85$, and $\alpha = 0.68$ for autonomy support, control, and interference, respectively.

Parents' achievement goals for their children

Two scales from the Patterns of Adaptive Learning Scales (PALS, Midgley et al., 2000) assessing children's perceived parent goals for them were adjusted for parents. Parents' mastery goals measured their emphasis on the development of children's knowledge and skills in mathematics (6 items, e.g., "I want my child to understand mathematical concepts, not just do the work"), and parents' performance goals measured their emphasis on children's demonstration of competence in mathematics (5 items, e.g., "I would like it if my child could show that s/he is better at class work than other students in his/her class"). Confirmatory Factor Analysis demonstrated a good fit for the two-dimensional model: $\chi^2(22) = 41.29$, $p < 0.01$, $\chi^2/df = 1.89$, CFI = 0.984, GFI = 0.964, NNFI = 0.959, RMSEA = 0.066 (0.034–0.097), SRMR = 0.042. Cronbach reliability was $\alpha = 0.72$ and $\alpha = 0.74$ for mastery and performance goals, respectively.

Table 1 Bivariate correlations of the latent factors under examination and means, standard deviations, skewness and kurtosis of the corresponding distribution

	1	2	3	4	5	6	7	8	9
1. Parent mastery goals									
2. Parent performance goals	.263**								
3. Parent self-efficacy beliefs	.138**	.163**							
4. Parent beliefs of children's efficacy	.254**	.563**	.360**						
5. Parent positive homework affect	.101**	.145**	.254**	.329**					
6. Parent negative homework affect	−0.026	0.011	−.237**	−.248**	−.361**				
7. Parent autonomy support	.231**	.084*	.182**	−0.005	.113**	0.069			
8. Parent control	.092*	.207**	.166**	0.015	.206**	.084*	.594**		
9. Parent interference	−.105**	.238**	−0.009	−0.045	.099**	.163**	.268**	.409**	
M (SD)	4.51 (.51)	3.13 (.90)	3.59 (.67)	3.57 (.79)	3.50 (.95)	1.50 (.63)	3.90 (.71)	3.51 (.91)	1.61 (.53)
Skewness	−1.443	0.082	−0.277	−0.222	−0.583	1.706	−0.869	−0.43	1.364
Std. Error of Skewness	0.087	0.088	0.089	0.088	0.089	0.088	0.088	0.087	0.087
Kurtosis	2.536	−0.657	−0.604	−0.033	−0.211	3.056	0.594	−0.558	2.55
Std. Error of Kurtosis	0.175	0.176	0.177	0.175	0.177	0.177	0.175	0.174	0.174

Parent beliefs of child's efficacy in mathematics

The *Self-Efficacy Scale* from *Motivated Strategies for Learning Questionnaire (MSLQ)* (Pintrich & De Groot, 1990) was appropriately adjusted for parent use in order to examine parent beliefs of their child's efficacy to do well in mathematics (9 items, e.g., "Compared with other students in his/her class, I expect my child do well in math"). Confirmatory Factor Analysis demonstrated a good fit for a unidimensional model: $\chi^2(10) = 15{,}61$, $p < 0.11$, $\chi^2/df = 1.56$, CFI = 0.994, GFI = 0.978, NNFI = 0.989, RMSEA = 0.053 (0.01–0.099), SRMR = 0.025. Cronbach reliability value was $\alpha = 0.78$.

Parents' self-efficacy beliefs

Parents' perceived ability to assist children in mathematics was assessed with the scale of Parental Self-Efficacy for Helping the Child Succeed in School (PEHCSS) (Walker et al., 2005) (7 items, e.g., "I know how to help my child to do well in math"). Confirmatory Factor Analysis demonstrated a good fit for a unidimensional model: $\chi^2(10) = 15{,}18$, $\chi^2/df = 1.52$, $p < 0.15$, CFI = 0.993, GFI = 0.980, NNFI = 0.986, RMSEA = 0.047 (0.016–0.096), SRMR = 0.041. Cronbach reliability value was $\alpha = 0.86$.

Parent homework-related affect

In order to measure parent affect related to children's homework, a scale based on the Positive and Negative Affective Schedule (Watson et al., 1988) was developed for parents. Parents were asked to report how much they usually experienced ten emotions that are typical in academic situations (e.g., Pekrun et al., 2002), five of which were positive (i.e., enjoyment, joy, relief, pride, satisfaction), and the rest were negative (i.e., sadness, anger, worry/anxiety, boredom, disappointment). Confirmatory Factor Analysis demonstrated a good fit for the two-dimensional model: $\chi^2(12) = 25{,}53$, $p < 0.05$, $\chi^2/df = 2.12$, CFI = 0.990, GFI = 0.970, NNFI = 0.970, RMSEA = 0.076 (0.031–0.100), SRMR = 0.038. Cronbach's *alpha* reliability was $\alpha = 0.83$ and $\alpha = 0.75$ for parent positive affect and negative affect, respectively.

Data analysis

First, confirmatory factor analyses were carried out for all latent variables, the results of which are presented in the previous section. Second, in order to test our hypotheses, the sample was randomly divided into two equal parts. On the first part, an exploratory procedure was applied, through which a specific structural model was derived. The second data segment was used to test the proposed model in a following confirmatory procedure via LISREL8.0. Missing data were handled by list-wise deletion, since the available sample was adequately large.

Results

Table 1 shows means, standard deviations and bivariate correlations of the latent constructs. Focusing on the most worth noticing, the three parental homework involvement practices (autonomy, control, interference) were positively correlated to one another

($r=0.59$, $p<0.01/r=0.27$, $p<0.01/r=0.41$, $p<0.01$, respectively). Mastery approach goals were positively correlated with autonomy support ($r=0.23$, $p<0.01$) and negatively correlated with interference ($r=-0.11$, $p<0.01$). Parents' self-efficacy beliefs were positively correlated with positive affect ($r=0.25$, $p<0.01$) and negatively with negative affect ($r=-0.24$, $p<0.01$). Similarly, parents' beliefs of child's efficacy were also positively correlated with positive affect ($r=0.33$, $p<0.01$) and negatively with negative affect ($r=-0.25$, $p<0.01$). Positive affect was positively correlated with all three parental homework involvement practices ($r=0.11$, $p<0.01/r=0.21$, $p<0.01/r=0.10$, $p<0.01$, respectively), whereas negative affect was positively correlated with control and interference ($r=0.08$, $p<0.05/r=0.16$, $p<0.01$, respectively).

Next, structural equation modeling with maximum likelihood estimation was applied on the data using LISREL 8.8 (Joreskog & Sorbom, 1996). All variables were constructed as latent factors with two indicators and each indicator consisted of a random set of half items (parceling technique, Little et al., 2002; Matsunaga, 2008). The analysis started using the first part of the data set (N = 403) with a full mediation model based on the theoretical assumptions and study hypotheses depicted in Fig. 1. An iterative exploratory process led to an acceptable model by removing the insignificant paths until all remaining structural regression coefficients were significant. The proposed model was applied to the second part (N = 404) which was supported by a good fit: $\chi^2(193)=264.87$, $\chi^2/df=1.37$, $p<0.001$, CFI = 0.986, GFI = 0.945, RMSEA = 0.031 (0.022–0.040), RMR = 0.049. Figure 2 presents the SEM model showing the effects and the mediating role of affect in predicting parents' involvement.

With respect to our first hypotheses (1a and 1b), as expected, parent mastery goal predicted autonomy support positively ($b=0.25$, $p<0.001$) and interference negatively ($b=-0.20$, $p<0.001$), whereas parent performance goal predicted interference ($b=0.41$, $p<0.001$) and

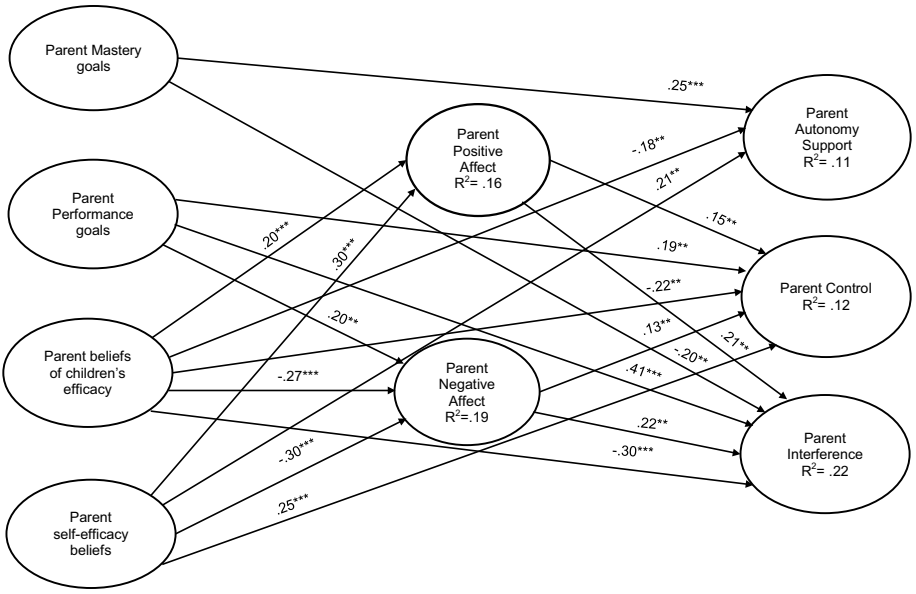

Fig. 2 Associations among parents' goals, parents' self-efficacy, parent beliefs on children's' efficacy, parent homework affect, and parental involvement (autonomy support, control, interference). All coefficients are standardized. Note: *p < .05, **p < .01, ***p < .001

control positively ($b=0.19$, $p<0.01$). Contrary to our first hypothesis, however, the negative associations between parent mastery goal and controlling practices, on the one hand, and parent performance goal and autonomy supportive practices, on the other hand, were not confirmed. In partial support of Hypothesis 2 and Hypothesis 3, parent beliefs of the child's efficacy negatively predicted not only control ($b=-0.22$, $p<0.01$) and interference ($b=-0.30$, $p<0.001$) but also autonomy support ($b=-0.18$, $p<0.01$), and parent self-efficacy beliefs positively predicted autonomy support ($b=0.21$, $p<0.01$) and control ($b=0.25$, $p<0.001$) but not interference. Hypothesis 4a was rejected since positive parent affect unexpectedly predicted control ($b=0.15$, $p<0.01$) and interference positively ($b=0.21$, $p<0.01$) and did not predict autonomy support. Parent negative affect, as expected, predicted controlling ($b=0.19$, $p<0.01$) and interfering ($b=0.22$, $p<0.01$) practices positively but, as previously, it did not negatively predict autonomy support confirming only partially Hypothesis 4b. The proportion of variance explained (R^2) for each dependent variable were as follows: autonomy 11%, interference 22%, control 12%, negative affect 19%, and positive affect 16%.

Mediation analysis

Mediation analysis using Sobel's, Aroian's, and Goodman's tests were performed in order to investigate the statistical significance of the indirect effects and support the proposed mediating role of parents' affect during homework. In the above mediation tests, the reported *p*-values are drawn under the assumption of a two-tailed *z*-test of the hypothesis that the mediated effect equals zero in the population.

The results did not support the mediational role of parent affect between parents' goals and homework involvement practices rejecting Hypothesis 5. However, they indicated significant indirect effects of both parent positive and negative affect in a number of paths. Specifically, the associations between parent beliefs of children's efficacy on controlling and interfering involvement practices were significantly mediated by negative affect at a=0.05 level [Sobel's test: $z=2.17$, $p=0.030$; Aroian's test: $z=2.15$, $p=0.031$; Goodman's tests $z=2.19$, $p=0.028$ for control/Sobel's test: $z=2.34$, $p=0.019$; Aroian's test: $z=2.31$, $p=0.021$; Goodman's test: $z=2.37$, $p=0.018$ for interference]. Moreover, the indirect effect of parent self-efficacy on control and interference via negative affect was statistically significant at a=0.05 level [Sobel's test: $z=2.17$, $p=0.030$; Aroian's test: $z=2.15$, $p=0.031$; Goodman's tests $z=2.19$, $p=0.028$ for control/Sobel's test: $z=2.42$ $p=0.015$; Aroian's test: $z=2.40$, $p=0.016$; Goodman's tests $z=2.45$, $p=0.014$ for interference].

Similarly, the indirect effect of parent beliefs of children's efficacy on control and interference via positive affect was statistically significant at a=0.05 level [Sobel's test: $z=2.42$, $p=0.015$; Aroian's test: $z=2.37$, $p=0.017$; Goodman's test: $z=2.47$, $p=0.013$ for control/Sobel's test: $z=2.44$, $p=0.014$; Aroian's test: $z=2.40$, $p=0.016$; Goodman's test: $z=2.49$, $p=0.013$ for interference]. The indirect effect of parent self-efficacy on control via positive affect was found statistically significant at a=0.05 level [Sobel's test: $z=2.35$, $p=0.018$; Aroian's test: $z=2.30$, $p=0.021$; Goodman's tests $z=2.40$, $p=0.016$ for control. The above results confirmed the mediating role of negative and positive affect between parents' efficacy beliefs for the child and for themselves, on the one hand, and parent control and interference during homework, on the other, and partially supported Hypotheses 6 and 7.

Discussion

The present study aimed to investigate the reasons behind qualitatively different parental involvement practices in their children's math homework. Parent motivational beliefs related both to their child and to themselves and their affect during homework involvement were examined as predictors of three involvement practices, autonomy support, control, and interference. Specifically, to explain why parents may adopt the above three practices while assisting their child in math homework, the pattern of associations among parent goals for their child's achievement (mastery and performance), parent beliefs for their child's efficacy in math, and their self-efficacy beliefs to assist their child in mathematics, as well as their positive and negative affect during homework was explored using SEM. Overall, the results of the study indicate that, at least in the case of mathematics for fifth graders and in the Greek educational context, parents' motivational beliefs are significant predictors of their involvement in children's homework, whereas their affect mediates the association only between those motivational beliefs that are related to efficacy appraisals and involvement practices.

Parent motivational beliefs and parental homework involvement practices

Parent goals for their child's achievement were found significant direct predictors of their involvement practices during math homework. As expected, parents' mastery goals positively predicted autonomy support and negatively interference, whereas their performance goals positively predicted control and interference. These findings are generally in line with previous research (Gonida & Cortina, 2014; Mageau et al., 2016; Pomerantz et al., 2006) providing further evidence on the critical role that parents' achievement goals for their child play in how they will get involved in their child's math homework. When parents focus on understanding and skill development, they are more likely to adopt an autonomy supportive way of assisting their child in homework that promotes self-regulated learning in math such as providing facilitating hints, encouraging self-monitoring and self-evaluation. Moreover, they are less likely to use interference because this very intrusive practice shifts the control of learning from the child to the parent and is incompatible with the child's deep learning and personal development. On the contrary, parents who focus on child's high marks and demonstration of competence tend to adopt both control and interference during homework to assure their child's good performance, but not without cost. Experiencing negative affect while assisting their child via controlling and interfering practices is very likely indicating that performance-oriented parents are more likely to worry a lot, feel anxious or even angry about their child's performance. Opposite to our expectations, yet similar to prior research in the same context (Gonida & Cortina, 2014), nor parent performance goals predicted autonomy support, neither parent mastery goals predicted control negatively. Autonomy support during homework in the present study describes parents' constructive help supporting children's self-regulated learning. This kind of assistance may also serve the purpose of enhancing children's achievement and, thus, may not be totally rejected by those parents who place great emphasis on children's grades and school success. The absence of negative association between parent mastery goals and control may imply that parents may not always perceive control, at least as operationalized in the present study, as a debilitating practice for their children's learning. For example, in a certain school context where high achievement is emphasized like the Greek educational

context, even mastery-oriented parents may not avoid monitoring their child's homework and material understanding to assure learning. Obviously, more research is required to better delineate parents' understanding of control and its relation to their involvement in homework in specific school contexts; factors like teacher goals as well as how homework is situated in a class (e.g., the objectives, characteristics, and representations of homework for teachers, students, and parents) should be taken into account to better understand parents' involvement in homework.

Parent beliefs of children's efficacy were found as negative predictors of control and interference. As expected, parents who don't trust their child's academic efficacy in math are more inclined to control her/his homework, in order to assure that s/he has done it correctly and as required by the teacher; even worse, they are very likely to interfere in maladaptive ways such as doing the homework on their own (Gonida & Cortina, 2014; Silinskas et al., 2015; Tunkkari et al., 2021). Moreover, the less they trust their child academically, the more negative emotions such as worries, disappointment or even boredom may be experienced during homework (Pomerantz et al., 2005; Silinskas et al., 2015). Surprisingly, however, parent beliefs for the child's efficacy in math negatively predicted autonomy support and the promotion of self-regulated learning. Although this unexpected finding has to be further confirmed by future research, it may indicate that parents who don't trust their children's math abilities increase guidance and tutoring in order to help them build their cognitive, metacognitive and self-regulatory learning skills. Parental help with the homework content (e.g., via facilitating hints, metacognitive strategy use, self-monitoring and self-evaluation) can be of particular importance when parents believe that their child is not very good in math and needs their support to succeed. Moreover, the significant positive correlations among all three involvement practices in the present study favor the interpretation that parents may use the whole repertoire of their practices when they believe that their child is not very good in math and needs their support to succeed, taking into account their child's specific needs in relation to the assigned homework each time. These results expand previous knowledge on the crucial role of parent beliefs for child's academic efficacy for parental involvement in children's knowledge (Gonida & Cortina, 2014; Silinskas et al., 2015).

The study also corroborated the limited previous evidence about parental self-efficacy beliefs and their association with autonomy support (Katz et al., 2011; O'Sullivan et al., 2014). However, parent efficacy beliefs positively predicted not only autonomy support but also control. This finding indicates that when parents hold positive beliefs in relation to their competence to help their child succeed at school, they are more likely to foster their child's autonomy and self-regulated learning, but they may also adopt less adaptive practices (e.g., monitoring of homework). This finding may indicate the role of the child's prior achievement and specific needs in math homework, at least as perceived by parents. That is, when parents believe that they can have a positive influence on their child's math performance, depending on their child's prior math achievement and needs profile, they may alternatively adopt adaptive or less adaptive practices in homework — autonomy support when the child is doing well and control when s/he faces difficulties in completing homework successfully. Besides, this finding may also have to do with how parents perceive control, at least in the specific context and as was used in the present study. Control as homework monitoring may not be perceived as a non-appropriate way of getting involved in children's homework. Given the specific context, Greek parents who believe they can make a difference in their children's school performance may also consider

homework monitoring as an adaptive practice and part of their parental role, and not so intrusive as interference which was found to be unrelated to parent efficacy beliefs. The issue of how parents construct their parental role in relation to their children's school success, including their involvement in homework, and the relative importance of parental beliefs of children's school success, have been supported by recent evidence (Tunkkari et al., 2021; Wei et al., 2019).

Parent affect and parental homework involvement practices

Parent affect was associated with controlling and interfering practices but not with autonomy-supportive ones. It is worth noting that both parent negative and positive affect predicted control and interference positively indicating that not only parents who experience negative emotions (e.g., worries, anxiety, disappointment, boredom) employ control and interference while assisting their child in math homework, but also parents who experience positive emotions may employ the same practices. While the first was an expected finding and is in line with previous evidence (e.g., Silinskas et al., 2015), the second was quite surprising that needs to be tested by future research. However, a potential explanation could be related to parents' knowledge and skills to support their children with qualitatively appropriate practices. Irrespective of their positive or negative affect during homework, some parents may be more competent in using controlling practices including interference than in using practices promoting their child's autonomy and self-regulated learning. Supporting child's autonomy and self-directed types of learning is a more demanding task than checking over homework or even providing ready-made answers to a task. Parents often lack such knowledge and may have conceptualized involvement in homework in relation to less adaptive practices. Consequently, parent negative affect may not be detrimental for the children only per se (Pomerantz et al., 2005), but it may be even more detrimental because it is likely to predict less adaptive involvement practices during homework. In addition, children may not fully benefit from their parent's positive affect during homework if this positive emotional experience is associated to controlling practices.

Moreover, the results of the study indicate that parent affective experiences mediate the paths from parents' beliefs for the child efficacy and their own self-efficacy beliefs to their controlling and interfering practices. This higher energizing value of affect may occur due to the evaluative component of efficacy beliefs (either for the child or themselves as parents) that triggers affective experiences which, in turn, predict controlling and/or interfering practices. These findings further support the many pathways toward parental controlling practices during homework. Interestingly, however, the indirect path from parent performance goals to controlling practices via negative affect was not confirmed indicating the high importance of parent performance goals as direct predictors of controlling and interfering practices.

Limitations and future directions

Although the present study attempted to examine a large number of potential parental factors which may constitute the reasons behind qualitatively different practices in homework involvement, it has some limitations that raise questions for future studies. First, the data came only from parents' self-reports measured at a single time point. Longitudinal data combining other types of measures (e.g., diaries, observation) which have been used when children's outcomes in relation to parent homework involvement were examined (e.g.,

Pino-Pasternak, 2014; Pomerantz et al., 2005; Silinskas et al., 2015; Kallia & Dermitzaki, 2017) will shed further light on the 'why' aspect of parental involvement in homework. Moreover, parents' self-reported homework practices could be co-examined with children's perceptions of their parents' practices during homework (e.g., Dumont et al., 2014; Tunkkari et al, 2021). Second, the three distinct parental involvement practices were measured in relation to their frequency of use. Though this measurement choice is grounded on previous research (Gonida & Cortina, 2014; Silinskas et al., 2015; Tunkkari et al., 2021; Viljaranta et al., 2018), it should be explored whether different kinds of measurement of homework involvement account for nuances in the evidence. Third, as mothers are usually more involved in their children's school life and homework (e.g., Pomerantz & Eaton, 2001; Pomerantz et al., 2005), the number of fathers in our sample was low, and potential differences between mothers and fathers were not tested. Limited evidence suggests that mothers are more likely to respond to children's difficulties by offering help which is more stable across time, and their help and monitoring are higher longitudinally compared to fathers' (Silinskas et al., 2013). Future research may further explore gender differences in parent homework involvement practices. Finally, the study focused on several parental factors having motivational strength such as goals, efficacy beliefs for the child and themselves, as well as parent affect, but did not examine any factors related to the child such as prior achievement or behavioral indicators which also constitute significant factors behind parents' adoption of different homework involvement practices (e.g., Dumont et al., 2014; Silinskas et al., 2013, 2015).

Conclusions

Despite the above limitations, the present study provided new knowledge on the parent-related reasons behind qualitatively different practices in homework involvement. Our results indicated a complex pattern of associations among parent goals, efficacy beliefs and affect and multiple paths toward different practices. Parents' mastery goals function as a protective factor for adaptive involvement in homework such as support of autonomy and self-regulated learning, whereas parents' performance goals function as an important risk factor for less adaptive practices such as control or maladaptive practices such as interference. Parents' beliefs for the child's academic efficacy, as well as their own efficacy beliefs to contribute to their child's school success, may work adaptively, but they may also function via non-adaptive paths depending probably on other factors such as the child's prior achievement and needs profile or parents' constructed role in relation to child's school learning. The less adaptive involvement practices associated to parent affect may have to do with parents' representations of homework involvement and its influence on children's school success, as well as with their knowledge and skills about it, and they certainly call for replication by future research.

Useful insights for parents, school counselors, and teachers could be drawn by these findings about adaptive pathways to homework involvement. For example, school counselors and psychologists can support parents to develop evidence-based knowledge and skills about how to get involved in their child's homework and what to avoid. Further, since teachers' invitations to parents have been successful for parents' involvement (e.g., Yulianti et al., 2020), more frequent invitations for a closer teacher-parent collaboration including homework involvement, as well as provision of specific feedback to parents about their child's performance and academic behavior would be beneficial for all (students, parents, teachers).

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Declarations

Ethics approval and consent to participate The research project was approved by the Ethics Committee of the Institute of Educational Policy of Greece (Research Section). Entrance permission to the schools was provided by the Greek Ministry of Education. Parents completed informed consent forms for their participation in the study.

Conflict of interest Falanga Konstantina received a HFRI PhD Fellowship grant (GA. no. 40) from the Hellenic Foundation for Research and Innovation (HFRI) and the General Secretariat for Research and Technology (GSRT). Gonida Eleftheria and Stamovlasis Dimitrios, PhD supervisors, declare that they have no conflict of interest.

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Falanga Konstantina. School of Psychology, Aristotle University of Thessaloniki, Thessaloniki, Greece. E-mail: kfalanga@psy.auth.gr
Current themes of research
Parental involvement in students' learning, child development, motivational and affective processes in learning.
Most relevant publications in the field of Psychology of Education
Falanga, K., Gonida, E. (2022, in press). Parental involvement in children's homework: A literature review. *Journal of Hellenic Psychological Society, 27*, xx.
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Gonida Eleftheria. School of Psychology, Aristotle University of Thessaloniki, Thessaloniki, Greece
Current themes of research
Development of academic motivation, self-regulated learning, academic help seeking, parental involvement in students' learning.
Most relevant publications in the field of Psychology of Education
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Stamovlasis Dimitrios. School of Philosophy and Education, Aristotle University of Thessaloniki, Thessaloniki, Greece
Current themes of research
Methodological and epistemological issues and theory building, nonlinear dynamics (complexity, catastrophe theories, entropy) and their applications, application of advanced statistical methods.
Most relevant publications in the field of Psychology of Education
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