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The Quality of Maternal Homework Involvement: The Role of Adolescent and Maternal Factors

Previous studies have shown that more parental homework involvement is not always better when it comes to supporting children's academic achievement (for reviews, see Patall, Cooper, & Robinson, 2008; Pomerantz, Moorman, & Litwack, 2007). Aside contradictory findings on the quantity of parental homework involvement, less is known about the quality of parental homework involvement—in particular, what leads parents to use qualitatively different ways to become involved in their children's homework (Dumont, Trautwein, Nagy, & Nagengast, 2014; Gonida & Cortina, 2014). Because controlling involvement practices can have negative consequences for children's and adolescents' motivational and academic development (Gonida & Cortina, 2014; Moroni, Dumont, Trautwein, Niggli, & Baeriswyl, 2015), understanding of the role of adolescent and maternal factors of the quality of parental homework involvement is needed. Previous research on the topic has, however, focused either on adolescent factors, such as academic functioning (Dumont et al., 2014; Núñez et al., 2017), or on parental factors, such as beliefs about the child's competence and motivation to help with homework (Gonida & Cortina, 2014; Katz, Kaplan, & Buzukashvily, 2011) as antecedents of the quality of parental homework involvement. As such, the relative importance of these factors is unknown. Consequently, the aim of the present study was to examine the extent to which both adolescent (i.e., academic functioning and academic emotions) and maternal factors (i.e., beliefs and emotions in homework situations) are associated with the quality of maternal homework involvement, and the extent to which this quality contributes to adolescents' subsequent academic achievement. Studies on the correspondence between children's and parents' reports in an academic or learning context, and their antecedents are rare (e.g., Cheung, Pomerantz, Wang, & Qu, 2016; Su, Doerr,

Johnson, Shi, & Spinath, 2015). Thus, we examined the quality of maternal homework involvement from both adolescents' and mothers' perspectives.

The Quality of Parental Homework Involvement

Parental involvement in homework is often conceptualized through self-determination theory (SDT; Ryan and Deci, 2000, 2017). A central aspect of parental homework involvement is the dimension of autonomy support versus control and how it contributes to fulfilling children's basic psychological needs for autonomy, competence, and relatedness (Ryan & Deci, 2017). *Autonomy support* refers to parental support that is sensitive to the child's needs and allows the child to work independently (Moorman & Pomerantz, 2008; Pomerantz et al., 2007). Autonomy-supporting parents trust in their children's abilities and avoid extensive involvement when the child does not ask for it; nevertheless, they provide help and support when the child is asking for it (Cooper, Lindsay, & Nye, 2000; Pomerantz et al., 2007). These kinds of parenting practices in homework situations are assumed to support the child's feelings of autonomy and competence (Ryan & Deci, 2017). *Control*, in turn, refers to parental involvement that is restricting the child's initiative and opportunities to work independently with the use of directives and commands (Moorman & Pomerantz, 2008; Pomerantz et al., 2007). Extensive control has been assumed to give children the impression that they are not capable of influencing their own surroundings and therefore, it has been assumed to be detrimental to children's psychological needs (Moorman & Pomerantz, 2008; Ryan & Deci, 2017).

Furthermore, previous studies have acknowledged that the conceptualization of control is far more complex; as such, they have identified two theoretically and empirically separate aspects of control—*psychological control* and *behavioral control* (see Barber, 1996, 2002). Behavioral control is operationalized as parental monitoring, rule-setting, and general knowledge of a child's life, whereas psychological control is operationalized as parental

control that is intrusive, dominant, and that affects the child's mind, feelings, and behavior using guilt, love withdrawal, and shame (Barber, 1996; Grolnick & Pomerantz, 2009). It has been shown that psychological control predicts psychological problems, poor school achievement, and daily negative emotions (Aunola & Nurmi, 2004; Aunola, Tolvanen, Viljaranta, & Nurmi, 2013; Barber, 1996).

In the present study, we investigated two types of parental homework involvement: autonomy support and psychological control. Based on SDT, we conceptualized autonomy support as representing a positive form of involvement, whereas psychological control was conceptualized as representing a negative form of involvement. Earlier research on parental involvement in the homework context has focused on either parents' evaluations (e.g., Gonida & Cortina, 2014) or children's reports of parental involvement (e.g., Dumont et al., 2014). Children's reports have been assumed to be less valid because of inaccurate evaluation skills (Su et al., 2015). In turn, parents' reports have been criticized for being biased due to social desirability, especially when evaluating negative aspects of parental behavior, such as psychological control (Sessa, Avenevoli, Steinberg, & Morris, 2001; Su et al., 2015). The few studies including both children's and parents' reports of involvement in an academic or learning context have shown moderate to high correspondence between these two perceptions in parental control (Cheung et al., 2016; Dinkelman & Buff, 2016; Su et al., 2015) and weak correspondence in autonomy support (Cheung et al., 2016). Because of relatively modest correspondence found between children's and parents' reports, focusing solely on either perspective may give biased results of parental behavior and lead to inaccurate conclusions of its predictive power (Cheung et al., 2016). Consequently, in the present study, both adolescents' and mothers' perceptions of maternal autonomy support and psychological control in homework situations were examined.

Antecedents of the Quality of Parental Homework Involvement

Belsky's (1984) model of three distinguishable determinants of parenting (i.e., factors related to the child, factors related to the parent, and contextual factors, such as socioeconomic status) provides a meaningful framework to describe different types of antecedents of the quality of parental homework involvement (e.g., Pomerantz & Grolnick, 2017). In the present study, we focused on the first two determinants. Of the broader contextual factors, we controlled for the effect of socioeconomic status. Of adolescent factors, we examined academic functioning (i.e., academic achievement and task avoidance), and positive and negative academic emotions. Of maternal factors, we examined mothers' positive and negative emotions in homework situations and beliefs about adolescents' school success.

Previous studies have shown, following Belsky's (1984) model, that different child factors—especially those related to academic functioning—are associated with parental homework involvement (Dumont et al., 2014; Pomerantz & Eaton, 2001). It has been found, for example, that the poorer the child's achievement, the more the parents report being involved in ways that can be perceived as intrusive and controlling by the child (Hoglund, Jones, Brown, & Aber, 2015; Pomerantz & Eaton, 2001). In contrast, the higher the child's achievement, the more child- and parent-perceived autonomy-supportive practices parents apply (Cooper et al., 2000; Dumont et al., 2014). Similarly, it has been found that a child-rated high effort and low procrastination in homework situations are related to perceived positive involvement practices (Dumont et al., 2014). Moreover, positive and negative *academic emotions*—that are directly related to achievement activities or outcomes, such as learning and achievement—may play a role in parental homework involvement (Pekrun, 2017). For example, similarly as an instructor's enthusiasm in learning situations may promote the child's excitement and positive academic emotions, a child's enthusiasm may affect the instructor's enthusiasm in learning situations (Pekrun, Goetz, Titz, & Perry, 2002).

Thus far, research on the role of child factors on parental homework involvement has mainly focused on the role of academic achievement, and clearly less is known about the role of learning behavior and academic emotions. It has been suggested, however, that a child's behavior can be particularly influential for parental homework involvement since it is more observable to parents than more distal achievement is (Dumont et al., 2014; Patall et al., 2008). In the present study, a child's behavior in homework situations was operationalized as *task-avoidant behavior*, that is, a child's tendency to lose focus on the task when facing difficulties (Onatsu-Arvilommi & Nurmi, 2000), which typically leads to poor subsequent achievement and skill development (Aunola, Nurmi, Niemi, Lerkkanen, & Rasku-Puttonen, 2002; Kiuru et al., 2014; Onatsu-Arvilommi & Nurmi, 2000).

Following Belsky's (1984) model, different parental factors—especially those related to parents' emotions and beliefs about a child's competence—have also been associated with parental homework involvement (Gonida & Cortina, 2014; Pomerantz & Grolnick, 2017; Silinskas, Kiuru, Aunola, Lerkkanen, & Nurmi, 2015). It has been suggested that parenting is an affective endeavor in which *positive and negative emotions* are important promoters of parenting practices (Dix, 1991; Pomerantz, Grolnick, & Price, 2005). Parents' own emotional states can influence parental homework involvement in multiple ways (Pomerantz et al., 2007). For example, parents' negative emotions can lead them to use more controlling and intrusive involvement practices, such as unrequested help and monitoring (Pomerantz & Eaton, 2001; Silinskas et al., 2015). Nevertheless, as most of the previous studies have focused on parents' emotions in relation to the quantity of homework involvement (monitoring and help; e.g., Pomerantz, Wang, & Ng, 2005; Silinskas et al., 2015), little is known about parents' emotions in relation to the quality of homework involvement. Studies have also shown that the *beliefs* and expectations parents have about a child's competence and performance are associated with a child's actual performance as well as parental

involvement in children's schooling (Frome & Eccles, 1998; Gonida & Cortina, 2014; Pomerantz, Grolnick, & Price, 2005). However, less is known about the role of parents' beliefs in relation to the quality of parental homework involvement. As an exception, Gonida and Cortina (2014) found that parents' stronger beliefs about their child's efficacy were associated with parents' perceptions of cognitive engagement, whereas negative beliefs were associated with parents' perceptions of controlling involvement practices.

Overall, previous research on the antecedents of parental involvement has thus far focused on either child (e.g., Dumont et al., 2014) or parental factors (e.g., Gonida & Cortina, 2014). Because there is a lack of studies including both, the relative importance of child and parental factors is unknown. Another limitation of previous research is that the previous studies have used either parents' reports (e.g., Cooper et al., 2000) or children's reports (e.g., Dumont et al., 2014) of parental behavior but have rarely combined these two aspects (e.g., Cheung et al., 2016). Because previous studies have found high to moderate correspondence between children's and parents' reports of parental control (Cheung et al., 2016; Dinkelmann & Buff, 2016; Su et al., 2015) and weak correspondence of autonomy support (Cheung et al., 2016), it is possible that children's and parents' perceptions also have different antecedents. In the present study, we examined the role of both adolescent and maternal factors in relation to adolescents' and mothers' perceptions of the quality of maternal homework involvement.

The Role of Parental Homework Involvement in Adolescents' Subsequent Academic Achievement

As suggested by SDT, empirical studies have also provided evidence that autonomy-supportive practices predict higher subsequent achievement, whereas parental control is associated with poor subsequent achievement (Dumont et al., 2012; Dumont et al., 2014; Moroni et al., 2015). Nevertheless, studies that have examined the predictive power of both children's and parents' perceptions of parental behavior simultaneously have shown

inconsistent results (Cheung et al., 2016; Dinkelmann & Buff, 2016; Su et al., 2015). In some studies, parents' perceptions predicted children's academic achievement (Dinkelmann & Buff, 2016; Su et al., 2015), whereas, in some other studies, children's perceptions were more consistent predictors of their achievement (Cheung et al., 2016).

According to previous research, it is possible that adolescent and maternal factors affect the quality of parental homework involvement, which, in turn, is associated with subsequent academic achievement (e.g., Dumont et al., 2014; Gonida & Cortina, 2014). In the present study, we examined the possibility that adolescents' and mothers' perceptions of autonomy support and psychological control mediate the associations between adolescent and maternal factors and subsequent academic achievement.

Research Questions and Hypotheses

A schematic model with research questions are presented in Figure 1. The first aim of the present study was to examine the extent to which adolescents' and mothers' perceptions of autonomy support and psychological control are related to each other. It was expected that adolescents' and mothers' perceptions of autonomy support would be weakly associated (Cheung et al., 2016), whereas adolescents' and mothers' perceptions of psychological control would be moderately to highly associated (Dinkelmann & Buff, 2016; Su et al., 2015).

Our second and third aims were to examine the extent to which adolescent factors (i.e., academic achievement, task avoidance, and positive and negative academic emotions) and maternal factors (i.e., beliefs about adolescents' school success and positive and negative emotions) are associated with adolescents' and mothers' perceptions of autonomy support and psychological control. We expected that adolescents' poor academic functioning in terms of poor achievement and a higher level of task avoidance would be associated with both adolescents' and mothers' perceptions of psychological control (Dumont et al., 2014;

Pomerantz & Eaton, 2001; Silinskas & Kikas, 2019; Viljaranta et al., 2018). However, based on Dumont et al. (2014), adolescents' behavior was assumed to play a more important role than achievement. Because of the lack of previous studies, we did not set hypotheses for the associations between adolescents' academic emotions and adolescents' and mothers' perceptions of autonomy support and psychological control. In turn, we expected that mothers' positive emotions and higher beliefs would be more strongly associated with mother-perceived high autonomy support and low psychological control compared to adolescent-perceived quality (Dix, 1991; Gonida & Cortina, 2014; Silinskas et al., 2015). No hypotheses were set for the relative role of mothers' beliefs and emotions because of the lack of previous studies.

Finally, our fourth aim was to examine the extent to which adolescents' and mothers' perceptions of autonomy support and psychological control predict adolescents' subsequent achievement and to what extent adolescent and maternal factors predict adolescents' subsequent achievement through adolescents' and mothers' perceptions of autonomy support and psychological control. No specific hypotheses were set because previous findings on the predictive or mediating role of adolescents' and mothers' perceptions of autonomy support and psychological control are inconsistent and lacking. We set adolescents' gender, mothers' education and learning difficulties as control factors because previous studies have indicated that these background factors are associated with parental involvement and with the effect of parental involvement on achievement (Dumont et al., 2012, Silinskas, Leppänen, Aunola, Parrila, & Nurmi, 2010).

—Figure 1 here — (schematic model with research questions)

Method

Participants and Procedure

Participants of this study were part of a longitudinal research project focused on student learning and school well-being during the transition from primary to lower secondary school (Authors, 2013). The research project received ethical approval from the ethical board of the local university. Participants in this study came from a large sample of one age cohort from one large city ($n = 681$) and one middle-sized town from central Finland ($n = 166$). A total of 847 students ($M_{age} 12.32$, $SD = 0.36$, 54.0 % girls) were recruited from 57 school classes. We chose to study sixth graders because they experience several developmental (e.g., puberty) and educational changes (e.g., the upcoming transition from primary to lower secondary school). In early adolescence, autonomy seeking has also assumed to be particularly high when adolescents explore their identities and gradually take steps towards becoming more independent of their parents (Eccles et al., 1993).

Informed consent was provided for adolescents and their parents. Parents and adolescents filled out written consent of their participation in this study. Invitations to participate were addressed only to mothers; however, fathers were also given the opportunity to participate. A total of 662 mothers and 95 fathers provided responses. We focused on mothers' responses because the mothers' sample is likely to be more representative. Moreover, mothers are typically more involved in their children's homework than fathers (Grolnick & Slowiaczek, 1994). According to the independent samples t test, adolescents whose mothers did not respond to the questionnaire did not differ from adolescents whose mothers responded to the questionnaire in perceived psychological control. However, they differed from adolescents whose mothers responded to the questionnaire in perceived autonomy support (Cohen's $d = 0.34$), academic achievement (Cohen's $d = 0.54$), positive academic emotions (Cohen's $d = 0.18$), and negative academic emotions (Cohen's $d = -0.20$). Adolescents whose mothers did not respond to the questionnaire perceived less autonomy from their mothers, had lower academic achievement, had fewer positive academic emotions,

and more negative academic emotions than adolescents whose mothers responded to the questionnaire.

Adolescents' data were collected during school lessons. Adolescents filled in questionnaires and tests while supervised by trained research assistants. Parents were sent questionnaires either by post or electronically at approximately the same time in the fall of sixth grade. Mothers who filled in questionnaires reported their background information. There were 659 mothers who reported their own education: 2.3% had no vocational education, 1.5% had taken employment or vocational courses (minimum of 4 months), 29.0% had finished vocational upper secondary education, 23.4% had post-secondary education, 16.5% had a bachelor's or vocational college degree, 24.0% had completed university or other higher education, and 3.3% had a postgraduate degree. The sample was fairly representative of the Finnish general population in regard to demographic characteristics (Official Statistics of Finland, 2017a, 2017b; for more detailed descriptions of the sample, see Authors, 2018a, 2018b).

Measures

Descriptive statistics of the study variables and their reliabilities are presented in Table 1.

Adolescents' Questionnaire

Adolescents' perceptions of the quality of homework involvement (Grade 6, fall).

Adolescents' perceptions of the quality of homework involvement were measured through autonomy support and psychological control. Autonomy support was assessed with six items adapted from the Learning Climate Questionnaire (Black & Deci, 2000; Williams, Saizow, Ross, & Deci, 1997) using a five-point scale (1 = never, 5 = always; e.g., "My parents take into account how I would like to do my homework and prepare for tests"). Psychological

control was assessed with three items using a five-point scale (1 = never, 5 = always; e.g., “My parents pressure me with homework/preparing for tests”).

Adolescents’ positive and negative academic emotions (Grade 6, fall). Adolescents’ academic emotions were measured with the Finnish version of the Achievement Emotions Questionnaire (Pekrun et al., 2011), which was adapted for school-aged students (for reliability and validity of the Finnish version, see Sainio, Eklund, Hirvonen, Ahonen, & Kiuru, 2019). Adolescents were asked to consider to what extent they felt different positive and negative emotions toward learning Finnish and math using a five-point scale (1 = disagree, 5 = agree). Positive emotions toward learning Finnish and math were assessed with three statements (e.g., “I enjoy learning new things”). Negative emotions toward learning Finnish and math were assessed with five statements (e.g., “Studying makes me anxious/nervous”). To represent positive and negative academic emotions, positive emotions toward learning Finnish and math were combined, as were negative emotions toward learning Finnish and math.

Adolescents’ academic achievement (Grade 5, spring and Grade 6, spring).

Adolescents’ academic achievement was based on GPA across all school subjects (range = 5 to 10) from the spring of fifth and sixth grade as gathered from registers.

Mothers’ Questionnaire

Mothers’ perceptions of the quality of homework involvement (Grade 6, fall). Mothers’ perceptions of the quality of homework involvement was assessed through autonomy support and psychological control. Autonomy support was based on a shorter version of the Learning Climate Questionnaire (Black & Deci, 2000; Williams et al., 1997) and was assessed with six items using a five-point scale (1 = never, 5 = always; e.g., “I let my child choose and give him/her options”). Psychological control was assessed with two items using a five-point scale (1 = never, 5 = always; “I have to pressure my child to do homework”).

Mothers' beliefs about adolescents' school success (Grade 6, fall). Mothers' beliefs about adolescents' school success were measured with two items (questions modified from previous studies; see Aunola et al., 2002; Eccles Parsons, Adler, & Kaczala, 1982; Frome & Eccles, 1998; Pesu, Aunola, Viljaranta, Hirvonen, & Kiuru, 2018) using a five-point scale (1 = poorly, 5 = very well; "How well is your child doing at the moment in school?"; "How well do you think your child will do later on in lower secondary school?").

Mothers' perceptions of adolescents' task avoidance in homework situations (Grade 6, fall). Mothers evaluated adolescents' task avoidance in homework situations using the Behavioral Strategy Rating Scale (Aunola, Nurmi, Parrila, & Onatsu-Arvilommi, 2000; for validity see Zhang, Nurmi, Kiuru, Lerkkanen, & Aunola, 2011). Mothers were asked how their child typically behaves in homework situations using a five-point scale (1 = never, 5 = always). The Behavioral Strategy Rating Scale consists of five statements, of which two are positively worded items (e.g., "Does the child actively attempt to solve even difficult situations and tasks?") and three negatively worded items (e.g., "Does the child have a tendency to find something else to do instead of focusing on the task at hand?"). The positively worded items were reversed to measure task avoidance before calculating the mean score.

Mothers' positive and negative emotions in homework situations (Grade 6, fall). Mothers were asked to consider how they feel in situations where they help or guide their child with homework using six questions on a five-point scale (1 = not at all, 5 = very much; see also Silinskas et al., 2015). Positive emotions were measured by three items (e.g., "I feel satisfaction") and negative emotions were measured by three items (e.g., "I feel irritated"). The rating scale was based on modified questions used by Pomerantz, Wang, and Ng (2005) and Poulou and Norwich (2002).

—Table 1 here— (Descriptive statistics of the study variables)

Data Analysis

The analyses were carried out in the following steps. First, we tested the measurement model for adolescents' and mothers' perceptions of autonomy support and psychological control using confirmatory factor analysis. This model included separate factors for adolescents' and mothers' perceptions. Second, we utilized structural equation modeling (SEM). Adolescent and maternal factors were set as predictors and they were allowed to correlate, as were the residuals of the dependent variables. Third, possible indirect effects from adolescent and maternal factors to subsequent achievement via adolescents' and mothers' perceptions of autonomy support and psychological control were estimated after controlling for adolescents' prior achievement. For the final model, only significant paths were included. We controlled for adolescent gender, mothers' education and learning disabilities in the SEM analyses by estimating paths to four latent factors. Finally, as additional analyses, we included a sample of fathers in the SEM analyses to see whether the results would differ from the model where only mothers' perceptions of autonomy support and psychological control were included.

All the analyses were carried out using the Mplus Version 8.0 (Muthén & Muthén, 1998–2017). The model parameters were estimated using a robust full-information maximum likelihood estimator. The goodness-of-fit of the estimated models was evaluated using four different indicators: the χ^2 test, comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). Non-significant χ^2 values, CFI values above 0.95, an RMSEA value below 0.06, and an SRMR value below 0.08 indicated good model-fit (Hu & Bentler, 1999; Muthén & Muthén, 1998–2017). CFI values below 0.90, and RMSEA and SRMR values above 0.10 were considered indicators of poor fit (Kline, 2011).

Results

Correspondence Between Adolescents' and Mothers' Perceptions of the Quality of Maternal Homework Involvement

We conducted confirmatory factor analysis for adolescents' and mothers' perceptions of autonomy support and psychological control. The model included four separate factors for adolescents' and mothers' perceptions of autonomy support and psychological control. The CFA results showed that the fit of the factor model was good after allowing the residuals of two of the similar items on adolescents' and mothers' perceptions of autonomy support to correlate: ($\chi^2 [111] = 319.460, p < .001; CFI = 0.94; RMSEA = 0.05; SRMR = 0.05$).

Our first research question aimed to investigate the extent to which adolescents' and mothers' perceptions of the quality of maternal homework involvement are related to each other. The CFA results showed that adolescents' and mothers' perceptions of autonomy support and psychological control were separate but related constructs. Adolescents' and mothers' perceptions of autonomy support were weakly correlated ($r = .22, p < .001$), whereas perceptions of psychological control showed a moderate correlation ($r = .57, p < .001$). Next, we tested the difference in correlations between adolescents' and mothers' perceptions of autonomy support and psychological control using the model constraint command. The results showed that the difference was statistically significant ($estimate = -.186, SE = .032, p < .001$) suggesting that correspondence between adolescents' and mothers' perceptions was higher in psychological control than in autonomy support.

Correlations between study variables are presented in Table 2.

—Table 2 here—(correlations)

Adolescent and Maternal Factors and Their Associations with the Quality of Maternal Homework Involvement

Our second and third research questions aimed to investigate to what extent adolescent and maternal factors are associated with adolescents' and mothers' perceptions of autonomy

support and psychological control. The estimated SEM model had good model fit ($\chi^2 [263] = 723.905, p < .001; CFI = 0.90; RMSEA = 0.05; SRMR = 0.06$). The results of the final SEM model including only statistically significant paths are shown in Figure 2.

Adolescent factors and their associations with the quality of maternal homework involvement. The results for autonomy support in homework situations showed that adolescents' positive and negative academic emotions were associated with adolescents' (but not with mothers') perception of autonomy support: The more adolescents experienced positive academic emotions and the less they experienced negative academic emotions, the more they perceived autonomy support from their mothers. Adolescents' positive academic emotions had the strongest association with adolescents' perception of autonomy support. Adolescents' task avoidance in homework situations was associated with mothers' (but not with adolescents') perception of autonomy support: The less adolescents showed task avoidance in homework situations, the more their mothers reported using autonomy support.

The results for psychological control in homework situations showed that adolescents' negative academic emotions were associated with adolescents' (but not with mothers') perception of psychological control: A high level of negative academic emotions was related to higher levels of perceived psychological control from their mothers. In turn, adolescents' prior academic achievement and task avoidance were associated with mothers' (but not with adolescents') perception of psychological control: The poorer the adolescents' prior academic achievement and the higher the level of adolescents' task avoidance in homework situations, the more mothers reported using psychological control. Adolescents' task avoidance had the strongest association with mother-perceived psychological control.

Maternal factors and their associations with the quality of maternal homework involvement. The results for autonomy support in homework situations showed that mothers' negative emotions were associated with mothers' (but not adolescents') perception of

autonomy support: The fewer negative emotions mothers had, the more they reported using autonomy support. In addition, mothers' positive emotions and beliefs were associated with adolescents' and mothers' perceptions of autonomy support: The more positive emotions and the stronger the beliefs mothers had about their child's school success, the more adolescents and their mothers perceived autonomy support. Mothers' positive emotions had the strongest association with mother-perceived autonomy support.

The results for psychological control in homework situations showed that only mothers' beliefs were associated with adolescents' perception of psychological control: The lower beliefs mothers had about their child's school success, the more adolescents perceived psychological control from their mothers. Mothers' beliefs and negative emotions were associated with mothers' perception of psychological control: The lower beliefs mothers had about their child's school success and the more they had negative emotions, the more they reported using psychological control. In turn, mothers' positive emotions were not associated with adolescents' or mothers' perceptions of psychological control.

Regarding control factors, we found that adolescent gender was associated with both adolescents' (*standardized $\beta = .21, p < .001$*) and mothers' perceptions of psychological control (*standardized $\beta = .13, p = .002$*): Boys perceived more psychological control and mothers also reported using more psychological control on boys than girls.

—Figure 2 here— (adolescents' and mothers' perceptions of autonomy support and psychological control)

Adolescent and Maternal Factors Predicting Subsequent Achievement Through the Quality of Maternal Homework Involvement

First, we examined the extent to which adolescents' and mothers' perceptions of autonomy support and psychological control predicted adolescents' subsequent achievement at the end of sixth grade after controlling for prior achievement at the end of fifth grade. The

results showed that mothers' perception of psychological control (*standardized β of the cross-lagged effect* = $-.168$, $p < .001$) significantly predicted adolescents' achievement development: The more mothers reported psychological control, the poorer was adolescents' subsequent achievement. In turn, adolescents' perceptions of autonomy support and psychological control as well as mother-perceived autonomy support did not predict adolescents' achievement gains ($ps > .05$).

Next, because only mother-perceived psychological control predicted adolescents' subsequent achievement, we examined the extent to which adolescent and maternal factors predicted adolescents' subsequent achievement via mother-perceived psychological control. Three significant indirect effects were found. First, adolescent task avoidance predicted subsequent achievement via mothers' perceptions of psychological control (*standardized indirect effect* = $-.084$, $SE = .014$, $p < .001$; 95% CI [-0.116 , -0.056]): The more adolescents showed task avoidance in homework situations, the more mothers used psychological control, and the poorer were adolescents' achievement later on. Second, mothers' negative emotions predicted subsequent achievement via mothers' perceptions of psychological control (*standardized indirect effect* = $-.028$, $SE = .008$, $p < .001$; 95% CI [-0.046 , -0.014]): The more mothers' experienced negative emotions in homework situations, the more they used psychological control, and the poorer were adolescents' subsequent achievement. Third, mothers' beliefs predicted subsequent achievement via mothers' perceptions of psychological control (*standardized indirect effect* = $.027$, $SE = .012$, $p = .022$; 95% CI [0.007 , 0.056]): The lower beliefs mothers' had about adolescents' school success, the more they used psychological control, and the poorer were adolescents' subsequent achievement.

As additional analyses, we included a sample of fathers ($n = 95$) in the SEM analyses to see whether the results would differ from the model where only mothers' perceptions of autonomy support and psychological control were included. The results for the SEM model

that included both mothers' and fathers' perceptions showed that there were only two minor differences compared to the results reported above. First, parents' positive emotions were not associated with adolescents' perceptions of their parents' autonomy support (*standardized β* = .04, *p* = .282). Second, adolescents' positive academic emotions were associated with parents' perceptions of psychological control (*standardized β* = -.10, *p* = .008): The more adolescents showed positive academic emotions, the less their parents used psychological control in homework situations.

Discussion

This study examined the extent to which adolescent and maternal factors were associated with sixth-grade adolescents' and mothers' perceptions of the quality of maternal homework involvement and the extent to which these perceptions mediated the impact of adolescent and maternal factors on adolescents' subsequent achievement. First, the results showed that congruence between adolescents' and mothers' perceptions was higher in psychological control than in autonomy support. Second, adolescents' positive academic emotions had the strongest association with adolescents' perception of autonomy support, whereas mothers' positive emotions had the strongest association with mothers' self-perceived autonomy support. Mothers' beliefs about adolescents' school success had the strongest association with adolescents' perception of psychological control, whereas adolescent task avoidance had the strongest association with mothers' self-perceived psychological control. Finally, higher levels of adolescent task avoidance and mothers' negative emotions in homework situations as well as mothers' lower beliefs about adolescents' school success predicted adolescents' poorer subsequent achievement through mother-perceived psychological control.

Congruence Between Adolescents' and Mothers' Perceptions of the Quality of Maternal Homework Involvement

Our first research question examined the degree of correspondence between adolescents' and mothers' perceptions of autonomy support and psychological control in homework situations. Consistent with previous findings (Cheung et al., 2016; Dinkelmann & Buff, 2016) and our hypotheses, the results showed that adolescents' and mothers' perceptions of psychological control were moderately associated, whereas their perceptions of autonomy support were weakly associated. It is possible that mothers who are generally adopting a controlling parenting style are likely to use the same practices in other situations (Robichaud, Bureau, Ranger, & Mageau, 2018)—for example, when involved in their children's homework—which may contribute to increased correspondence between adolescents' and mothers' reports. By contrast, one explanation for a weak association between adolescents' and mothers' perceptions of autonomy support might be derived from SDT (Ryan & Deci, 2017). Mothers might think that they are supporting their children's need for autonomy, whereas adolescents themselves might perceive that mothers do not sufficiently satisfy this need. Because autonomy support becomes extremely important when children enter adolescence, it is also possible that adolescents become more sensitive to parents' control, which may affect their perceptions of maternal autonomy support (Cheung et al., 2016; Eccles et al., 1993). Overall, future studies should consider using both adolescents' and mothers' perceptions when examining the quality of maternal homework involvement.

The Role of Adolescent Factors in the Quality of Maternal Homework Involvement

Our second research question addressed the extent to which adolescent factors predicted adolescents' and mothers' perceptions of autonomy support and psychological control. Consistent with our expectations and previous findings (e.g., Dumont et al., 2014; Silinskas & Kikas, 2019; Viljaranta et al., 2018), adolescents' poor academic functioning in terms of poor prior academic achievement and higher level of task avoidance was associated

with mothers' higher perceptions of psychological control in homework situations. Moreover, adolescent task avoidance was negatively associated with mothers' perceptions of autonomy support, whereas academic achievement was not related to mothers' perceptions of autonomy support. One explanation for these findings is that mothers may perceive that an adolescent who is more focused in homework situations is capable of doing tasks on his/her own, which encourages mothers to grant autonomy, whereas task avoidance together with poor school grades may be seen as a sign of inability to do homework on his/ her own, which leads mothers to use psychological control (Kikas & Silinskas, 2016; Silinskas & Kikas, 2019). In addition, mothers may perceive that their controlling involvement is necessary in order to prevent children from doing poorly at school later on (Grolnick, 2003). Overall, task avoidance had the strongest association with mother-perceived psychological control, which supports our hypothesis and previous findings about the more significant role of children's behavior in homework situations to parental homework involvement compared to more distal achievement (Dumont et al., 2014).

The results showed further that academic emotions were only associated with adolescent-perceived quality of maternal homework involvement. Positive emotions were associated with adolescent-perceived autonomy support: The more adolescents experienced positive academic emotions, the more they perceived autonomy support from their mothers. In turn, negative academic emotions were associated with both adolescents' perceptions of autonomy support and psychological control: The more adolescents experienced negative academic emotions, the more psychological control and the less autonomy support they perceived from their mothers. It is possible that negative emotions toward learning are the result of adolescents' difficulties performing academic tasks, which may lead them to perceive mothers' involvement as intrusive and controlling (Silinskas et al., 2015). In contrast, adolescents who experience positive emotions toward learning may also perceive

their mothers' involvement to be more supportive. As far as we know, no previous studies have examined adolescents' academic emotions in relation to the quality of maternal homework involvement. In future studies, it would be important to examine these associations longitudinally because it is possible that the associations between academic emotions and the quality of homework involvement are reciprocal (see Pekrun et al., 2002).

However, in contrast to previous findings (Dumont et al., 2014) and our expectations, adolescents' prior achievement and task avoidance were not associated with adolescent-perceived quality of maternal homework involvement. One explanation for this might be that because of their limited abilities to self-monitor and associate their functioning with parental behavior, adolescents might not see that their parents' behavior is a reaction to their academic functioning. Another reason for the lack of associations between task avoidance and adolescent-perceived quality of maternal homework involvement might be that we used mothers' evaluations of adolescents' task avoidant-behavior, in contrast to children's own reports (Dumont et al., 2014) or teachers' reports (Viljaranta et al., 2018). Because of this, it is possible that the results were partly impacted by common method bias.

The Role of Maternal Factors in the Quality of Maternal Homework Involvement

Our third research question examined the extent to which maternal factors were associated with adolescents' and mothers' perceptions of autonomy support and psychological control. In line with our expectations and previous findings (Pomerantz et al., 2007), the results showed, that mothers' high positive and low negative emotions were associated with mothers' higher perceptions of autonomy support in homework situations. In turn, consistent with previous findings (Pomerantz & Eaton, 2001; Silinskas et al., 2015), mothers' high negative emotions were associated with their higher perceptions of psychological control. It is possible that mothers' negative emotions are a result of their struggles to get involved when their children are having problems with homework (Silinskas

et al., 2015), or that mothers experience negative emotions because adolescents experience them as well (Pomerantz et al., 2007).

However, only mothers' positive emotions (but not negative emotions) were associated with adolescents' perceptions of autonomy support: The more mothers experienced positive emotions in homework situations, the more adolescents' perceived autonomy support from their mothers, which would suggest that it is important for adolescents that mothers stay positive during homework situations (see Pomerantz, Wang, & Ng, 2005). Overall, these results supported our expectations about mothers' emotions being more strongly associated with mother-perceived quality of homework involvement compared to adolescents' perceptions. However, due to the correlational nature of our study, it is also possible that the associations between mothers' emotions and the quality of maternal homework involvement are backward. For example, parents who involve themselves in a controlling manner may enjoy involvement less and, therefore, exhibit more negative emotions (Pomerantz & Eaton, 2001).

The results also showed, in line with previous study by Gonida and Cortina (2014) and our expectations, that mothers' beliefs were associated with both adolescents' and mothers' perceptions of autonomy support and psychological control: The stronger the beliefs mothers had about their child's school success, the more autonomy support there was, whereas weaker beliefs were associated with higher psychological control perceived by adolescents and mothers. Overall, these results suggest that when mothers have higher beliefs about their child's achievement at school, they trust the child's abilities to do homework independently and therefore, support their autonomy, whereas mothers who have weaker beliefs about their child's achievement, do not trust their child's abilities to do homework and therefore, use more dominant, pressuring and intrusive involvement practices.

Adolescent and Maternal Factors Predicting Adolescents' Subsequent Academic Achievement Through the Quality of Maternal Homework Involvement

Our fourth research question examined the extent to which adolescents' and mothers' perceptions of autonomy support and psychological control predicted adolescents' subsequent achievement after controlling for prior achievement and the extent to which adolescent and maternal factors predicted adolescents' subsequent achievement via these perceptions. Regarding direct effects, the results indicated that only mothers' perceptions of psychological control negatively predicted adolescents' achievement: The more mothers perceived psychological control, the poorer was adolescents' subsequent achievement. This is in line with SDT by showing that psychological control inhibits children's sense of autonomy, competence and relatedness, which, in turn, impedes motivation and academic development and subsequently leads to poorer academic achievement (Dumont et al., 2012; Moorman & Pomerantz, 2008; Ryan & Deci, 2017). Overall, these results are in line with some previous studies (Dinkelman & Buff, 2016; Su et al., 2015) that found that when child- and parent-perceived control were examined in the same model, only parent-perceived control predicted children's achievement.

In contrast to theoretical predictions of SDT and despite a positive zero-order correlation, adolescents' perceptions of autonomy support did not predict their subsequent achievement after controlling for the effects of the other predictors. One reason for the lack of predictive power of autonomy support in our study might be that we used GPA as an indicator of academic achievement. Even though GPA has been suggested to be a better indicator of children's overall academic achievement than grades in specific subjects or test performance (Fan & Chen, 2001), it is possible that autonomy support has a greater impact on achievement-related outcomes, such as learning behavior, academic self-concept, or

motivation than on achievement itself (Barger, Kim, Kuncel, & Pomerantz, 2019; Dumont et al., 2012; Patall et al., 2008; Viljaranta et al., 2018).

Regarding the indirect effects, the results further showed that of adolescent factors, only task avoidance predicted subsequent achievement via mothers' perceptions of psychological control: A higher level of task avoidance in homework situations was associated with psychological control, which, in turn, was related to adolescents' poorer subsequent achievement. This is in line with previous findings of the evocative nature of children's behavior on parental involvement (Dumont et al., 2014; Viljaranta et al., 2018). Mothers may perceive adolescents' lack of persistence as inability to do homework independently, and they, therefore, exert more psychological control (Kikas & Silinskas, 2016; Silinskas & Kikas, 2019). In addition, we found that of maternal factors, mothers' negative emotions and beliefs predicted adolescents' subsequent achievement via mothers' perceptions of psychological control: A higher level of negative emotions in homework situations and lower beliefs about adolescents' school success were associated with psychological control, which, in turn, was related to adolescents' poorer subsequent achievement. Overall, it seems that mothers who experience more helplessness, irritation, and anger in homework situations and who have lower beliefs about their children's school success, also use more intrusive, pressuring, and dominating involvement practices, which inhibit adolescents' sense of autonomy, competence and relatedness and eventually lead to poorer achievement (Moorman & Pomerantz, 2008; Ryan & Deci, 2017).

Strengths and Limitations

The present study has many strengths. First, we examined the quality of maternal homework involvement using both adolescents' and mothers' perceptions, which has rarely been done in previous studies. Second, we examined both adolescent and maternal factors, some of which (e.g., academic emotions) have not been previously studied in relation to the

quality of homework involvement. Third, we controlled for prior academic achievement when examining the effect of the quality of maternal homework involvement on subsequent achievement, which has been suggested as an important methodological issue to help reduce overestimation (see Moroni et al., 2015).

However, there are also some limitations that affect the way our results can be generalized. First, our data for the quality of maternal homework involvement was cross-sectional, which does not allow us to make causal inferences about the changes related to involvement. In future studies, it would be important to examine the effect of the quality of parental homework involvement on academic achievement longitudinally. Second, our measures of adolescents' positive and negative academic emotions were not specifically related to homework situations but toward learning in general. This may have reduced the strength of the associations found between academic emotions and the quality of maternal homework involvement. Fourth, the scales of adolescent and mother-perceived psychological control had relatively weak reliabilities, which calls for further improvement of our short scales (consisting of 2 or 3 items). Because measurement error was taken into account in the SEM analyses for the quality of homework involvement, it adds nevertheless some confidence for the findings of the present study.

Conclusions

These results contribute to existing research in several ways. First, our study extended previous research on the congruence between children's and parents' reports of parental behavior by showing that adolescents and mothers perceived the quality of maternal homework involvement differently and that their perceptions also contributed differently to subsequent achievement. Therefore, in future studies, it would be important to consider using multiple informants. Second, our study showed that adolescent and maternal factors, such as adolescents' academic emotions and mothers' emotions and beliefs, were differently

associated with adolescents' and mothers' perceptions of autonomy support and psychological control, supporting the assumption that autonomy support and psychological control are distinct constructs having different purposes and mechanisms (see Barber, 2002). Third, our study highlighted the significance of adolescents' academic functioning, especially the level of task avoidance, on mother-perceived quality of homework involvement, a finding which underlines the importance of increasing mothers' awareness and understanding of different adolescent and maternal factors as well as their own responses to them.

Previous studies have suggested that cooperation between parents and teachers (e.g., Harris & Goodall, 2008) and parent training programs (e.g., Chang, Park, Singhe, & Sung, 2009) are important factors when trying to improve the quality of parental homework involvement. Our study suggests it would be important to give guidance and knowledge to mothers to help them not just support adolescents' autonomy but also avoid negative parenting practices when involving themselves in their child's homework.

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Table 1

Descriptive Statistics of the Study Variables

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	Cronbach's α	Range	
					Potential	Actual
<i>Adolescents</i>						
Perceived autonomy support	830	3.97	.74	.87	1-5	1-5
Perceived psychological control	830	2.75	.92	.63	1-5	1-5
Academic achievement, Grade 5, spring	694	8.25	.66		5-10	5.8-9.8
Academic achievement, Grade 6, spring	702	8.31	.73		5-10	6.1-9.8
Positive academic emotions	838	3.63	.73	.85	1-5	1-5
Negative academic emotions	839	2.00	.71	.85	1-5	1-5
Task avoidance in homework situations	661	2.22	.84	.89	1-5	1-5
<i>Mothers</i>						
Self-perceptions of autonomy support	659	3.87	.48	.74	1-5	2.2-5
Self-perceptions of psychological control	660	2.29	.84	.55	1-5	1-4.5
Positive emotions	659	3.69	.79	.79	1-5	1-5
Negative emotions	659	1.86	.78	.79	1-5	1-4.7
Beliefs about adolescents' school success	660	4.00	.68	.90	1-5	2-5

Table 2

Correlations between Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1 Adolescents' perceived autonomy support												
2 Mothers' self-perception of autonomy support	.24***											
3 Adolescents' perceived psychological control	-.22***	-.20***										
4 Mothers' self-perception of psychological control	-.27***	-.38***	.44***									
5 Academic achievement, Grade 5, spring	.25***	.26***	-.23***	-.58***								
6 Academic achievement, Grade 6, spring	.25***	.28***	-.26***	-.64***	.91***							
7 Adolescents' task avoidance	-.25***	-.37***	.21***	.76***	-.52***	-.56***						
8 Mothers' beliefs about adolescents' achievement	.31***	.34***	-.29***	-.64***	.68***	.66***	-.61***					
9 Adolescents' positive academic emotions	.50***	.13***	-.14***	-.25***	.27***	.27***	-.28***	.27***				
10 Mothers' positive emotions	.16***	.32***	-.08***	-.25***	.15***	.17***	-.29***	.25***	.09*			
11 Adolescents' negative academic emotions	-.39***	-.12***	.25***	.23***	-.25***	-.24***	.25***	-.27***	-.45***	-.13**		
12 Mothers' negative emotions	-.13**	-.34***	.08***	.45***	-.31***	-.33***	.41***	-.35***	-.16***	-.27***	.12**	

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

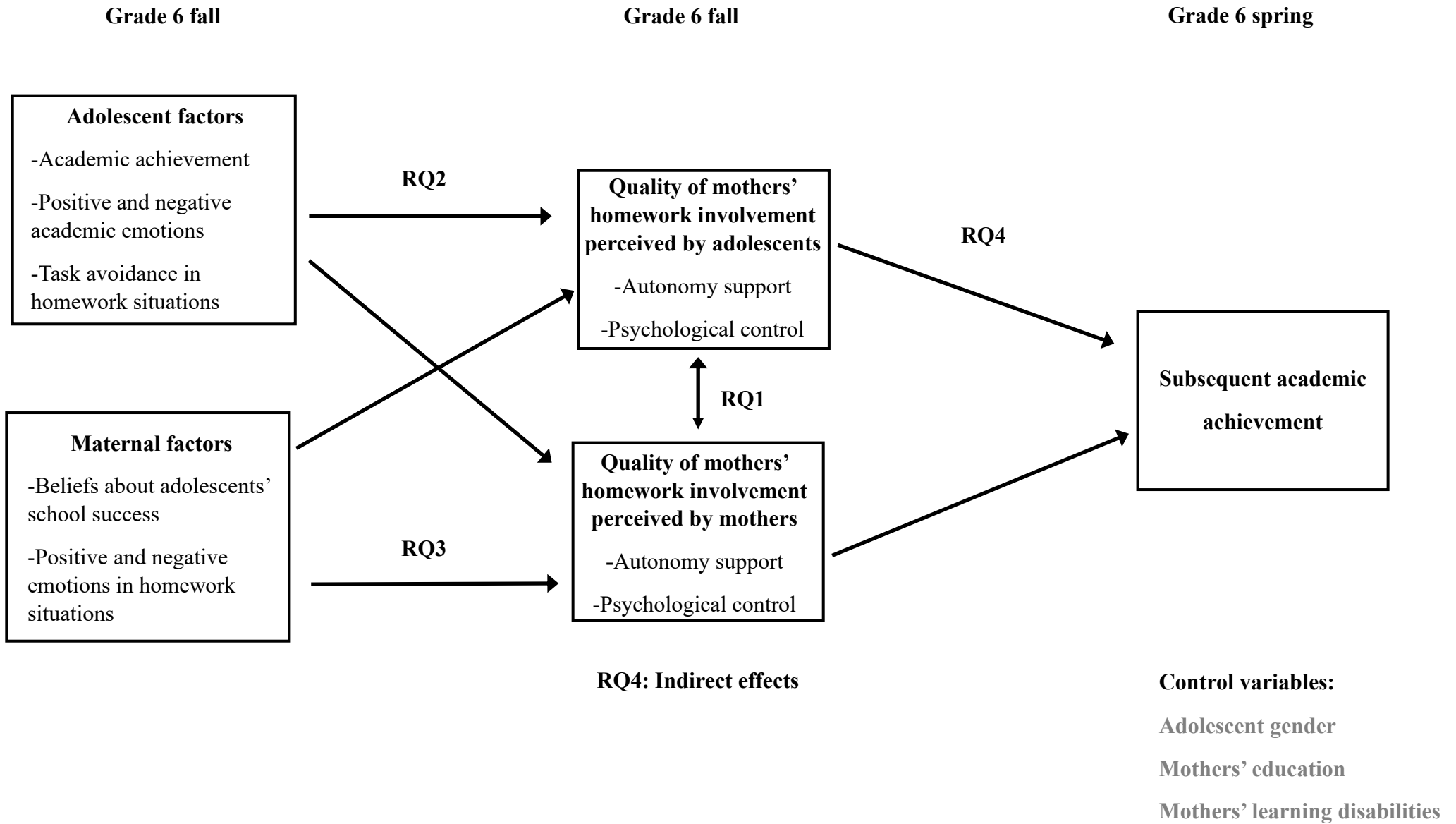


Figure 1. Schematic model for the associations between adolescents' and mothers' perceived quality of homework involvement, adolescent and maternal factors and their contribution to subsequent academic achievement. RQ = Research question.

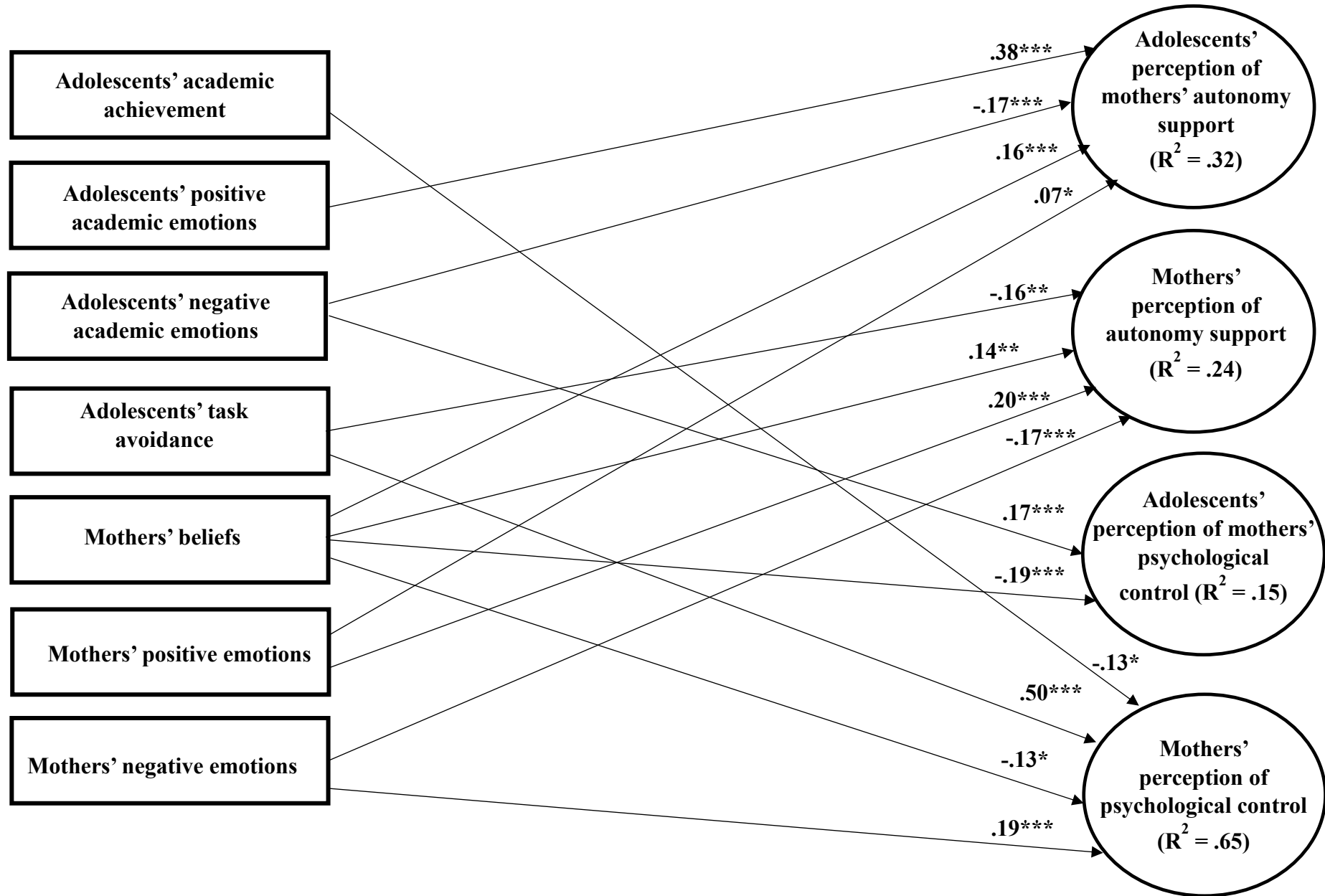


Figure 2. Associations between adolescent and maternal factors and adolescents' perceptions and mothers' self-perceptions of autonomy support and psychological control. Paths are presented as standardized estimates. *** $p < .001$, ** $p < .01$, * $p < .05$. Predictors and residuals of the dependent variables are allowed to correlate.