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Abstract

This study examined bidirectional associations between mothers' homework involvement (autonomy support and psychological control in homework situations), Finnish adolescents' academic motivation (intrinsic motivation, extrinsic motivation, amotivation), and school well-being (school satisfaction, school-related stress) across the transitions to lower and upper secondary school. The sample consisted of Finnish adolescents ($n = 841$; 457 girls; age 12 at T1) and their mothers ($n = 652$; T1). The results showed that increased levels of maternal psychological control in Grade 7 predicted adolescents' decreased school satisfaction in Grade 9 but only indirectly via increased amotivation. In turn, adolescents' increased levels of school satisfaction decreased maternal psychological control via increased intrinsic motivation within Grade 9 and the first year of upper secondary education. Taken together, more knowledge and understanding should be provided to mothers to help them to support adolescents' motivation and school well-being in more optimal ways.

Keywords: homework, motivation, school well-being, adolescence, parenting

Bidirectional Associations between Maternal Homework Involvement, Adolescents' Academic Motivation, and School Well-Being

Parents may attempt to promote adolescents' academic competence and motivation by involving themselves in their children's homework (Moroni et al., 2015; Pomerantz & Grolnick, 2017). Parental homework involvement that supports adolescents' autonomy might increase the internalization of academic goals and values, transforming them into personally valued behaviors and resulting in higher interest in and liking of school and learning (Hagger et al., 2015; Ryan & Deci, 2017). However, parents may choose their approach to homework based on adolescents' academic and motivational characteristics (Dumont et al., 2014; Scarr & McCartney, 1983). The majority of previous studies have focused on the associations between parental homework involvement and adolescents' academic achievement, and less attention has been paid to the relationship between parental homework involvement and adolescents' school well-being (see Dettmers et al., 2019; Yotyodying, 2012). In particular, the reciprocal interplay between parental homework involvement, adolescents' school well-being, and motivation is poorly understood. Given that educational transitions together with numerous developmental and social changes (e.g., puberty, increased need for autonomy, changes in peer and teacher relations) may serve as risk factors for declining motivation and well-being if not enough support is provided (Eccles & Roeser, 2011), more research is needed to gain a better understanding of how parents may support adolescents' motivation and school well-being during these transitions. Thus, in this study, bidirectional associations between the quality of maternal homework involvement, adolescents' academic motivation, and school well-being were examined across transitions to lower and upper secondary education. The focus was on mothers' homework involvement due to

research showing mothers being more involved in their offspring's schooling compared to fathers (Silinskas et al., 2010).

The Quality of Homework Involvement in Adolescence

During adolescence, major changes occur in adolescents' development and social relationships, as well as in the school environment. Such changes include puberty, maturation of cognitive abilities, and increased need for autonomy, as well as heightened importance of peer relationships and attempts to gain more independence from parents (Eccles et al., 1993; Hill & Tyson, 2009). At the same time in the school context, educational transitions are the most critical changes occurring in adolescents' school paths. In the Finnish educational system, the transition from primary school (Grade 6) to lower secondary school (Grade 7) is the first significant transition that adolescents encounter at the age of 13. The transition means a shift from a classroom teacher system to a subject teacher system, new peers, a higher workload, and expectancies of higher responsibility. After compulsory basic education (Grades 1–9), Finnish students face another critical transition from lower secondary school (Grade 9) to upper secondary education. This transition often entails more stress, pressure to receive good grades, and concerns about future education and career planning. At the end of lower secondary school, adolescents are expected to make a choice between continuing studies in the academic track or in the vocational track. This transition is the most critical one that further directs adolescents' opportunities to proceed in their educational paths and careers (Duineveld et al., 2017; Malmberg, 1996).

It is known that the numerous changes mentioned may challenge adolescents' motivation and school well-being if adolescents do not receive sufficient support from significant others, such as parents (Eccles & Roeser, 2011). Parental involvement with homework is among the

most typical ways that parents attempt to enhance adolescents' learning (Trautwein et al., 2006). Research has shown that parental homework involvement decreases in adolescence (Gonida & Cortina, 2014) and the significance of involvement may vary in different educational levels (Cooper et al., 2000; Hill & Tyson, 2009). However, less is known about how parental homework involvement, adolescents' motivation, and school well-being interact across educational transitions. Consequently, the longitudinal bidirectional associations between maternal homework involvement, adolescents' motivation and school well-being were the main focus of this study.

Self-determination theory (SDT; Ryan & Deci, 2017) can be used as a theoretical framework to distinguish the different types of parental homework involvement practices and their consequences for adolescents' motivation and well-being. According to this theory, the satisfaction of three universal psychological needs for autonomy (i.e., a sense of control and ownership of one's actions), competence (i.e., a sense that one is capable and can succeed), and relatedness (i.e., a sense of belonging) are essential for intrinsic motivation and well-being (Ryan & Deci, 2020). In this study, the main focus was on the need for autonomy. Among environmental factors, parents play an important role in supporting their adolescents' autonomy and thus promoting their intrinsic motivation and well-being.

Relying on SDT, previous research has conceptualized the quality of parental homework involvement through autonomy support and control. Autonomy support refers to parents' attempts to understand and respect adolescents' points of view by providing meaningful choices and options for completing homework (Pomerantz & Grolnick, 2017). At the same time, parents encourage adolescents to show initiative and solve problems independently by providing hints and suggestions. These behaviors are assumed to support adolescents' autonomy and to increase

their interest in learning (Ryan & Deci, 2017). Control, in turn, refers to parental pressure and the regulation of adolescents' behaviors toward a particular outcome through commands and directives that may diminish adolescents' sense of autonomy (Pomerantz & Grolnick, 2017; Ryan & Deci, 2020). Psychological control—an aspect of control aimed at influencing adolescents' minds, feelings, and behaviors through guilt, shame, and love withdrawal—has proven to be particularly detrimental to adolescents' motivation and well-being (for a review, see Soenens et al., 2010). Parental intrusion into adolescents' psychological worlds when they fail to meet parental standards for learning outcomes may thwart adolescents' self-expression (Soenens et al., 2010). In this study, the quality of homework involvement was examined through general autonomy support and psychological control.

Adolescents' Academic Motivation as a Mediator of the Associations between Parental Homework Involvement and Adolescents' School Well-Being

Following SDT, academic motivation can be conceptualized through amotivation, extrinsic motivation, and intrinsic motivation. Students who are amotivated lack the intention to do academic tasks, possibly because of their experiences of lower competence or a lack of interest and value (Ryan & Deci, 2020; Vansteenkiste et al., 2020). Amotivation serves as a risk factor for poor academic achievement (Vansteenkiste et al., 2020). In turn, extrinsic motivation is a heterogeneous category of motivation that includes controlled and non-autonomous forms of motivation (e.g., student does homework to avoid getting punished for not doing so or to receive approval from parents) and autonomous forms of motivation (e.g., student does homework because getting good grades is important for them or because they believe it is compatible with their own values; Ryan & Deci, 2020). In this study, the focus was on controlled and non-autonomous form of extrinsic motivation (i.e., external regulation), which is driven by external

reasons, such as rewards and punishments (Ryan & Deci, 2020). Finally, intrinsically motivated students do academic tasks because they have an inherent interest in and enjoy such tasks (Ryan & Deci, 2020). Intrinsic motivation is positively related to learning outcomes, whereas controlled and non-autonomous forms of extrinsic motivation are related to poorer grades (Baker, 2004; Manganelli et al., 2019).

Within SDT, Deci and Ryan (1985) introduced organismic integration theory (OIT), which is a valuable framework for illustrating how contextual factors, such as parental homework involvement, can facilitate or hinder the internalization (i.e., taking in the value of academic tasks but not accepting it as one's own) and integration (i.e., taking in the value of academic tasks and accepting it as a part of oneself) of externally regulated activities, such as homework. Following OIT, parental homework involvement that fulfills adolescents' sense of autonomy can increase internalization and integration processes. This may then lead adolescents to be more interested in homework (Ryan & Deci, 2017). Adolescents who have internalized or integrated the values and goals of academic tasks are also more likely to place a higher value on learning, which, in turn, may promote their well-being at school (Hagger et al., 2015; Ryan & Deci, 2017). In contrast, parental homework involvement that dominates, pressures, and hinders adolescents' sense of autonomy may forestall them from taking in academic goals and values. This may then lead to amotivation, lack of interest, lower value in learning, and poor school well-being (Hagger et al., 2015; Ryan & Deci, 2020).

Previous research has shown that parental autonomy support in the academic domain is positively related to students' autonomous forms of motivation and negatively related to controlled and non-autonomous forms of extrinsic motivation (Chirkov & Ryan, 2001; Katz et al., 2011; Moè et al., 2018), whereas parental control has been positively related to controlled

forms of extrinsic motivation (Yotyodying, 2012) and amotivation (Bartholomew et al., 2018). In turn, less empirical research has been conducted on the role of parental homework involvement in adolescents' school well-being (for exceptions, see Dettmers et al., 2019; Yotyodying, 2012). School well-being can be defined as students' subjective experiences in school including emotional, cognitive, and social elements (Hascher, 2004; Morinaj & Hascher, 2019). Studies have shown a positive association between parental support in homework situations and adolescents' well-being at school (Dettmers et al., 2019), whereas parental control has been related to lower well-being at school (Yotyodying, 2012). In this study, school well-being was defined as school satisfaction and school-related stress which were assumed to reflect positive and negative emotional experiences that may arise at school (see also Morinaj & Hascher, 2019). School satisfaction refers to students' subjective experiences of their liking, enjoyment, and interest in school (Eccles, 2004), whereas school-related stress is defined as students' experiences of incongruence between their inner resources and school-related demands and expectations (Salmela-Aro & Upadyaya, 2014; Wilks, 2008).

Following OIT, parental homework involvement may play a role in adolescents' school well-being by influencing their academic motivation. Despite this, to the best of our knowledge, only a few studies on this topic have been conducted. For example, Li et al. (2018) found that higher parental autonomy support was related to higher school satisfaction among adolescents via their higher autonomous forms of motivation. However, due to the cross-sectional nature of previous studies, the role of parental autonomy support and psychological control in adolescents' motivation and school well-being during educational transitions remains unknown. Considering adolescents' higher attempts to gain autonomy and independence on the one hand and the risk of declining motivation and well-being during educational transitions on the other hand (Eccles et

al., 1993; Eccles & Roeser, 2011), a better understanding of these associations is needed to avoid possible vicious cycles of low motivation and poor school well-being. Thus, one aim of this study was to examine the direct associations between maternal homework involvement and adolescents' school well-being, as well as indirect associations between maternal homework involvement and adolescents' school well-being through their academic motivation across transitions to lower and upper secondary school.

The Evocative Role of Adolescents' School Well-being and Academic Motivation in Parental Homework Involvement

Following evocative (Scarr & McCartney, 1983) and transactional theories (Sameroff, 2010), adolescents' characteristics may elicit certain responses from parents in homework situations. Much research has been conducted on the evocative role of academic achievement in parental homework involvement (e.g., Cooper et al., 2000; Dumont et al., 2014), but less is known about the role of students' school well-being as an antecedent of parents' homework involvement. Research has shown that students' school well-being may be reflected, for example, in their emotions, self-efficacy, and persistence in learning situations at home (Moè et al., 2018; Pekrun & Linnenbrink-Garcia, 2012) and thus be observable to parents. For example, students who are interested in school may also invest more effort when doing homework which, in turn, parents may perceive as willingness and ability to complete homework independently (Dumont et al., 2014). Consequently, this may lead parents to support adolescents' autonomy. Therefore, it was considered possible that students' well-being at school would influence parents' approaches to homework involvement.

It has been suggested that students' school well-being plays a role in their academic motivation (Liu, 2015; Yang et al., 2022). For example, Yang et al. (2022) found that

adolescents' academic stress was negatively related to their autonomous forms of motivation and positively related to their amotivation. Returning to SDT, adolescents' school well-being might contribute to their academic motivation, which, in turn, may elicit different responses from parents in homework situations (Dumont et al., 2014; Ryan & Deci, 2017). For example, adolescents who experience high levels of school-related stress might also perceive themselves as having little control over schoolwork (Baker, 2004; Liu et al., 2015) and experience incompetence in meeting academic demands. This may lead to amotivation, and a lack of engagement in homework which, in turn, may elicit high psychological control from parents (Dumont et al., 2014; Raufelder et al., 2015; Yang et al., 2022). Nevertheless, to the best of our knowledge, no previous study has examined the role of adolescents' motivation as a mediator of the associations between school well-being and parental homework involvement. Because educational transitions have been linked to a decline in motivation and well-being (Eccles & Roeser, 2011), a better understanding of these mechanisms could provide useful knowledge to parents and educators regarding ways to reduce challenges related to educational transitions.

The Present Study

In this study, the following research questions were investigated.

1. To what extent the quality of maternal homework involvement (autonomy support and psychological control) predicts adolescents' school well-being (school satisfaction and school-related stress) across the transitions to lower and upper secondary education? To what extent the quality of maternal homework involvement predicts adolescents' school well-being indirectly via academic motivation (intrinsic motivation, extrinsic motivation, and amotivation) across the transitions? Following OIT, it was expected that high autonomy support would predict adolescents' increased school satisfaction and decreased school-related stress, both directly and

indirectly, via higher intrinsic motivation (H1a; Chirkov & Ryan, 2001; Dettmers et al., 2019; Ryan & Deci, 2017; Yotyodying, 2012). We also expected that high psychological control would predict increased school-related stress and decreased school satisfaction, both directly and indirectly, via higher amotivation (H1b; Baker, 2004; Ryan & Deci, 2017; Yang et al., 2022).

2. To what extent adolescents' school well-being predicts the quality of maternal homework involvement across the transitions to lower and upper secondary school? To what extent school well-being predicts the quality of maternal homework involvement via academic motivation across the transitions? Due to the lack of previous studies, we could not establish exact hypotheses. However, we considered it possible that higher levels of school-related stress and lower levels of school satisfaction could indirectly predict higher psychological control via higher amotivation and lower intrinsic motivation (H2; Dumont et al., 2014; Ryan & Deci, 2017; Yang et al., 2022).

Due to research showing that parents may be more controlling in their involvement in their sons' homework and when their child is performing poorly at school (Dumont et al., 2014), adolescents' gender and general ability were set as control variables. Previous research has shown that general ability is a reliable predictor of adolescents' academic achievement (see Karbach et al., 2013). In addition, because parents' education and parenting styles may play a role in their homework involvement (Darling & Steinberg, 1993; Moroni et al., 2015), the influence of mothers' education and parenting styles were controlled for.

Method

Procedure

This study was not preregistered. In the following, we report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study (see also Simmons et al., 2011).

This study was part of a broader Finnish longitudinal study following a community sample of Finnish adolescents, their mothers, and teachers from a large Finnish town (135,000 inhabitants) and a middle-sized town (20,000 inhabitants) in Central Finland across educational transitions. The procedures of the broader longitudinal study were in line with the principles established by the Helsinki Declaration on research with human subjects. The study was evaluated and approved by the Human Sciences Ethics Committee of the local university.

Participants

Written consent from the adolescents and their parents was required. The adolescents' data were based on questionnaires that they completed during school lessons. Only students who answered questionnaires at least once during the first transition from Grades 6 to 7 were included in the sample. Of these adolescents, 841 participated in this study in the fall of Grade 6 (T1; mean age = 12.32 years, $SD = 0.37$, 457 girls), 834 in the fall of Grade 7 (T2), 825 in the spring of Grade 7 (T3), 697 in the fall of Grade 9 (T4), 690 in the spring of Grade 9 (T5), and 617 in the fall of their first year of upper secondary education (T6). Of the adolescents in T6, 68.6% attended academic track, 22.4% vocational track, and 9% attended either double-degree programs (i.e., combination of the academic and vocational tracks), post-comprehensive programs (programs that do not lead to an upper secondary certificate), apprenticeship training, or repeated Grade 9. Of the adolescents in T1, 96.2% had Finnish as their mother tongue, 1.8% were bilingual, and 1.9% were speakers of other languages. In turn, 0.1% did not report their mother tongue.

Adolescents' mothers were also asked to participate in this study. Mothers' data were based on questionnaires that mothers filled out either on paper or electronically in the fall terms of primary school (Grade 6), lower secondary school (Grades 7 and 9), and in the first year of upper secondary education. Of the mothers, 652 filled in questionnaires at T1 (mean age = 42, $SD = 5.49$), 654 at T2, 486 at T4, and 449 at T6. Of the mothers in T1, 651 provided their own level of education: 2.2% had no vocational education, 1.5% had taken employment or vocational courses (minimum of 4 months), 28.9% had finished vocational upper secondary education, 23.3% had post-secondary education, 16.7% had a bachelor's or vocational college degree, 24.0% had completed university or other higher education, and 3.4% had a postgraduate degree. The sample was fairly representative of the Finnish population with regard to demographic characteristics (Official Statistics of Finland, 2022).

We conducted attrition analyses to compare adolescents who participated in this study in all the time points ($n = 511$) with those adolescents who had missing data at least once out of the six measurement points ($n = 597$). Adolescents with full data reported less amotivation at T4 compared to adolescents with missing data ($d = 0.09$). Furthermore, boys had more missing data compared to girls ($d = 0.18$). Similar comparisons were made for mothers with full data ($n = 362$) and mothers who had missing data in at least once out of the four measurement points ($n = 746$). Mothers with complete data had higher educational level compared to mothers with missing data ($d = 0.35$).

Measures

Quality of maternal homework involvement (T1, T2, T4, and T6). Mothers rated their provision of autonomy support in homework situations using a short version of the Learning Climate Questionnaire (Black & Deci, 2000) consisting of six items on a five-point scale (1 =

never, 5 = *always*; e.g., “I try to understand the child's point of view;” $\alpha = .73 - .80$). Similarly, mothers rated psychological control in homework situations using two items on a five-point scale (1 = *never*, 5 = *always*; e.g., “I show how disappointed I am if the child has not done his/her homework/gets a bad grade on a test;” $\alpha = .55 - .71$; Tunkkari et al., 2021).

Adolescents’ academic motivation (T1, T3, and T5). Adolescents rated the reasons why they do homework, try to answer hard questions, and do well in school using a modified version of the Academic Self-Regulation Questionnaire (Ryan & Connell, 1989). Intrinsic motivation was measured using four items (e.g., “Because doing homework is fun;” $\alpha = .74 - .79$), extrinsic motivation was measured with seven items (e.g., “Because I’ll get in trouble if I don’t;” $\alpha = .79 - .83$), and amotivation was measured with six items (e.g., “I have no idea why;” $\alpha = .73 - .81$) on a five-point scale (1 = *disagree*, 5 = *agree*).

Adolescents’ school well-being (T1, T2, T4, and T6). Adolescents’ school well-being was measured through school satisfaction and school-related stress adapted from the Health Behavior in School-Aged Children Study (Currie et al., 2012; Kämppi et al., 2012). Adolescents rated their school satisfaction using three items (e.g., “I enjoy going to school;” $\alpha = .86 - .88$) and school-related stress using four items (e.g., “I have too much schoolwork;” $\alpha = .79 - .86$) on a five-point scale (1 = *complete disagree*, 5 = *completely agree*).

Control variables. Adolescents’ gender (1 = *girl*, 2 = *boy*), general ability, and mothers’ education and parenting styles were controlled for in the analyses. General ability was assessed at T1 as the number of correct answers in Raven progressive matrices consisting of 30 items (Raven, 1981). Mothers’ parenting styles (warmth, behavioral control, and psychological control) were measured at T1 using the modified Finnish version of Blocks’ Child Rearing Practices Report (Aunola & Nurmi, 2004). The modified scale consists of five statements

measuring warmth (e.g., “I often show my child that I love him/her”; $\alpha = .79$), six statements measuring behaviorally controlling parenting style (e.g., “My child should learn that we have rules in our family”; $\alpha = .72$), and four statements measuring psychologically controlling parenting style (e.g., “My child should be aware of how much I sacrifice for him/her”; $\alpha = .77$) on a five-point scale (1 = *not like me at all*, 5 = *very much like me*).

Data Analysis

The data is not publicly available due to ethical restrictions. The materials and analysis code for this study are available for reasonable request by emailing the corresponding author. The analyses were carried out as follows. To answer our research questions, a random intercept cross-lagged panel model (RI-CLPM) was utilized. First, between-level factors for the quality of maternal homework involvement (autonomy support and psychological control), adolescents’ school well-being (school satisfaction and school-related stress), and academic motivation (intrinsic motivation, extrinsic motivation, and amotivation) were built across the measurement points. The between-level factors were allowed to correlate with each other. Second, within-person factors were created for the quality of maternal homework involvement (autonomy support and psychological control), adolescents’ school well-being (school satisfaction and school-related stress), and academic motivation (intrinsic motivation, extrinsic motivation, and amotivation) separately for each time point. The within-person factors within each measurement point were allowed to correlate. Third, stability paths and direct and indirect cross-lagged associations between variables across different measurement points were estimated while controlling for the effects of adolescents’ gender and general ability, and mothers’ education and parenting styles. For indirect associations, a bootstrapping procedure with 95% confidence intervals (CIs) was used to confirm the discovered associations.

The analyses were conducted using the COMPLEX approach of the Mplus statistical package version 8.6 (Muthén & Muthén, 1998–2017) to take into account the clustered nature of the data (i.e., students nested within classrooms). The proportion of missing data for the main study variables ranged from 4.6% (adolescents' extrinsic motivation) to 48.9% (mothers' homework involvement, $M = 2.86$, $SD = 0.79$). Little's (1988) MCAR test showed that data on adolescents' school satisfaction, school-related stress, extrinsic motivation, and amotivation were not missing completely at random ($\chi^2[1545] = 1764.850$, $p < .001$). Therefore, missingness at random (MAR) was assumed, which is a weaker condition for missing data than missing completely at random (MCAR). The models were estimated using full information maximum likelihood estimation with robust standard errors (MLR). The goodness-of-fit of the estimated models was evaluated using the χ^2 test, comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). Non-significant χ^2 values, CFI values above .95, an RMSEA value below .06, and an SRMR value below .08 indicated good model fit (Hu & Bentler, 1999).

Results

Descriptive statistics and correlations between the study variables are presented in Tables 1 and 2. The first research question aimed to examine the extent to which the quality of maternal homework involvement (autonomy support and psychological control) predicts adolescents' school well-being (school satisfaction and school-related stress) directly and indirectly through adolescents' academic motivation (extrinsic motivation, intrinsic motivation, and amotivation). The final RI-CLPM model fit the data well: $\chi^2[161] = 285.826$, $p < .001$, CFI = .98, RMSEA = .04, and SRMR = .03. The between-level associations between the factors are presented in Figure 1. At the between-level, maternal autonomy support correlated negatively with maternal

psychological control and school-related stress. In turn, maternal psychological control had positive associations with adolescent amotivation and school-related stress and negative associations with intrinsic motivation and school satisfaction.

At the within-person level, the results showed that neither maternal autonomy support nor psychological control directly predicted adolescents' school satisfaction or school-related stress after taking into account the differences between individuals and the control factors (see Figure 1). However, two indirect paths from maternal homework involvement to adolescents' school well-being via their academic motivation were detected between T2 and T4, as well as within T4 and T6 (see Table 3 and Figure 1). First, increased levels of maternal psychological control in the fall of Grade 7 predicted increased levels of adolescent amotivation in the spring of Grade 7, which, in turn, predicted decreased school satisfaction in the fall of Grade 9. Second, decreased levels of maternal psychological control in the fall of Grade 9 predicted increased levels of adolescent intrinsic motivation in the spring of Grade 9, which, in turn, predicted increased levels of school satisfaction in the fall of the first year of upper secondary education.

The second research question aimed to examine the extent to which adolescents' school satisfaction and school-related stress predict maternal homework involvement directly and indirectly through adolescents' academic motivation. The results revealed that neither adolescents' school satisfaction nor school stress directly predicted maternal autonomy support or psychological control after considering the differences between individuals and the control factors. However, an indirect path from adolescents' school satisfaction to maternal homework involvement via academic motivation was detected within T4 and T6: Adolescents' increased levels of school satisfaction in the fall of Grade 9 predicted their increased levels of intrinsic motivation in the spring of Grade 9, which, in turn, predicted decreased levels of maternal

psychological control in the fall of the first year of upper secondary school. In addition, two marginally significant indirect paths from school-related stress to maternal homework involvement via academic motivation were discovered between T2 and T4, as well as within T4 and T6. Increased levels of adolescent school-related stress in the fall of Grade 7 predicted decreased levels of mothers' autonomy support in the fall of Grade 9 via increased levels of amotivation in the spring of Grade 7. In turn, decreased levels of adolescent school-related stress in the fall of Grade 9 predicted decreased levels of mothers' psychological control in the fall of the first year of upper secondary education via increased levels of intrinsic motivation.

Discussion

Given the transactional nature of parenting (Sameroff, 2010) and the fact that educational transitions may be potential risk factors for adolescents' declining motivation and well-being if sufficient support is not provided (Eccles & Roeser, 2011), the aim of this study was to provide a novel understanding of the bidirectional relationship between the quality of maternal homework involvement, adolescents' academic motivation, and school well-being across educational transitions to lower and upper secondary education. The results showed that high maternal psychological control played a detrimental role in adolescents' school satisfaction by influencing their amotivation. The results also lend some support for the evocative role of adolescents' school well-being and motivation in maternal homework involvement by showing that mothers respond to adolescents showing higher interest in and liking of school and learning by decreasing their psychologically controlling homework involvement. Taken together, more knowledge and a better understanding of these factors should be provided to mothers to help them support adolescents with low motivation and school well-being during educational transitions.

Bidirectional Associations between Maternal Homework Involvement, Adolescents' Academic Motivation, and School Well-Being across Educational Transitions

The first aim of this study was to examine the extent to which the quality of maternal homework involvement, in terms of autonomy support and psychological control, predicted adolescents' school well-being directly and indirectly via their academic motivation during educational transitions to lower and upper secondary education. The results showed, in contrast to our expectations, that psychological control did not directly predict adolescents' school well-being at any time point. However, the results lend some support for our hypothesis by showing that maternal psychological control played a role in adolescents' school well-being by influencing their motivation. In particular, the more mothers exhibited psychological control at the beginning of lower secondary school, the more the adolescents became amotivated, which led to decreased school satisfaction at the end of lower secondary school. This suggests that high guilt, dominance, and shame when adolescents do not meet parental standards thwart them from taking in academic goals and values (Bartholomew et al., 2018; Ryan & Deci, 2017). This then leads to a lack of motivation to engage in academic tasks and lower interest in and enjoyment of school (Ryan & Deci, 2020; Yotyodying, 2012). Interestingly, at the mean level, mothers reported more psychological control in homework situations post-transition than in pre-transition to lower secondary school. It is possible that due to numerous changes related to the educational transition, such as new school subjects and higher workloads, mothers at the beginning of lower secondary school are worried about adolescents' learning and try to pressure them to do their homework and to do well in school (Dumont et al., 2014).

In contrast to our expectations and previous findings (Dettmers et al., 2019; Li et al., 2018; Yotyodying, 2012), maternal autonomy support did not promote adolescents' school satisfaction

directly or indirectly via higher intrinsic motivation at any time point studied. One reason for these results may be that we used mother-reported autonomy support, which has been shown to correlate only weakly with adolescents' perceptions (Cheung et al., 2016). In addition, adolescents' perceptions of their mothers' behaviors may be more strongly related to their own development compared to mothers' actual behaviors (Cheung et al., 2016). However, maternal autonomy support had a negative association with adolescents' school-related stress at the between-level which suggests that adolescents who receive more autonomy support from their mothers are less likely to experience school-related stress compared to other adolescents.

The second aim of this study was to examine the extent to which adolescents' school well-being predicted maternal homework involvement, both directly and indirectly, via academic motivation across educational transitions to lower and upper secondary school. Overall, following the evocative (Scarr & McCartney, 1983) and transactional theories (Sameroff, 2010), the results lend some support for the bidirectional associations between maternal homework involvement, adolescents' academic motivation, and school satisfaction. In particular, adolescents' higher levels of school satisfaction pre-transition to upper secondary education promoted their intrinsic motivation, which, in turn, evoked less psychological control from mothers post-transition to upper secondary education. Similarly, it was found that the less adolescents received psychological control from their mothers in homework situations pre-transition to upper secondary education, the more they were intrinsically motivated, which, in turn, promoted their school satisfaction post-transition to upper secondary education. These results suggest that when mothers utilize less pressure, guilt, and shame in homework situations, adolescents who are transitioning to upper secondary education may be more likely to take in external academic values and demands and thus be more interested in learning. This may further

promote students' enjoyment of learning and contribute to higher school well-being (Hagger et al., 2015; Ryan & Deci, 2017). In turn, mothers whose adolescents like school and are more interested in learning may perceive that adolescents are capable of taking care of homework independently and are thus less likely to exert psychological control in homework situations (Dumont et al., 2014; Li et al., 2018; Pekrun & Linnenbrink-Garcia, 2012).

The results also provided tentative support for the role of school-related stress in subsequent maternal homework involvement and adolescents' academic motivation. There was a weak indirect effect from adolescents' school-related stress on maternal autonomy support via amotivation: Higher school-related stress at the beginning of lower secondary school increased amotivation which, in turn, decreased maternal autonomy support at the end of lower secondary school. It is possible that adolescents who experience more school-related stress also perceive themselves as having little control over academic activities and perceive that they are unable to meet the academic standards of lower secondary school, which increases amotivation (Baker, 2004; Liu, 2015; Ryan & Deci, 2017). Mothers may perceive adolescents' lack of interest in learning as alarming and thus provide less support for adolescents' autonomy (Dumont et al., 2014). A weak indirect effect was also found from school-related stress on maternal psychological control via intrinsic motivation: The less adolescents reported school-related stress pre-transition to upper secondary education, the more intrinsically motivated they were, which, in turn, led to lower psychological control from mothers post-transition to upper secondary education. It may be that adolescents who have more resources to cope with academic demands related to the transition to upper secondary education also feel more in control over academic activities, which leads to higher levels of interest toward learning and thus lower maternal psychological control (Baker, 2004; Dumont et al., 2014; Ryan & Deci, 2017).

Limitations and Future Directions

This study has some limitations that should be considered when interpreting the results. First, only mothers' homework involvement was examined because the sample of fathers consisted of participants who voluntarily answered questionnaires; thus, the sample size for fathers was relatively small. Future studies should include fathers to gain more understanding of whether the associations between homework involvement, adolescents' academic motivation, and school well-being differ by mothers and fathers. Second, the quality of homework involvement was based on mothers' reports instead of adolescents' reports because only mothers' perceptions of autonomy support and psychological control were available across all time points. Because adolescents and mothers may perceive the provision of autonomy support in a somewhat different manner (Cheung et al., 2016), future studies should consider examining autonomy support based on both perceptions. In addition, we examined mothers' general homework involvement instead of subject-specific involvement. Because parental homework involvement may differ among different school subjects (for math, see Falanga et al., 2023), future studies should focus on subject-specific homework involvement. Third, the scale of psychological control had relatively modest reliability at the first two time points, suggesting a need to improve the short scale. Fourth, only a negative form of control (i.e., psychological control in homework situations) was examined. Previous research has shown that autonomy support combined with a positive form of control, that is structure, may be particularly important for increasing students' competence and motivation (Dumont et al., 2014; Farkas & Grolnick, 2010). Thus, future studies should consider measuring structure to increase understanding of the associations between homework involvement, student motivation and school well-being. Fifth, we examined only emotional elements of school well-being in terms of school satisfaction and

school-related stress. Due to school well-being including not only emotional, but also cognitive and social elements (Morinaj & Hascher, 2019), in future studies, it is advisable to conceptualize school well-being more comprehensively. Finally, this study was conducted in Finland, a relatively individualistic society. Educational transitions, their timing, and the changes related to them may be different in different countries, which should be taken into consideration when generalizing these results to other countries and school systems.

Conclusions and Practical Implications

The results of this study lend some support for the bidirectional associations between maternal homework involvement, adolescents' academic motivation, and school well-being by showing that mothers reacted to adolescents' higher school satisfaction and intrinsic motivation by decreasing their psychological control, which, in turn, was positively related to adolescents' intrinsic motivation and school satisfaction. The results also highlighted the detrimental role of maternal psychological control in elevating adolescents' amotivation and lowering school satisfaction in lower secondary school. These results indicate that mothers should be further educated regarding how their controlling approach toward homework may influence adolescents' motivation and school well-being. In addition, mothers should be provided with more tools for how to involve themselves in adolescents' homework in more supportive ways. Interventions that aim to enhance parents' autonomy-supportive practices may prove useful in promoting students' motivation and school well-being (Moè et al., 2018). Because the results suggest that high levels of school-related stress may act as a risk factor for decreased intrinsic motivation and increased amotivation during educational transitions, more tools and support should be provided to students regarding how to cope with changing academic demands related to educational transitions.

References

- Aunola, K., & Nurmi, J.-E. (2004). Maternal Affection Moderates the Impact of Psychological Control on a Child's Mathematical Performance. *Developmental Psychology, 40*(6), 965–978. <https://doi.org/10.1037/0012-1649.40.6.965>
- Baker, S. R. (2004). Intrinsic, Extrinsic, and Amotivational Orientations: Their Role in University Adjustment, Stress, Well-Being, and Subsequent Academic Performance. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues, 23*(3), 189–202. <https://doi.org/10.1007/s12144-004-1019-9>
- Bartholomew, K. J., Ntoumanis, N., Mouratidis, A., Katartzi, E., Thøgersen-Ntoumani, C., & Vlachopoulos, S. (2018). Beware of your teaching style: A school-year long investigation of controlling teaching and student motivational experiences. *Learning and Instruction, 53*, 50–63. <https://doi.org/10.1016/j.learninstruc.2017.07.006>
- Black, A.E., & Deci, E.L. (2000). The effects of instructors' autonomy support and students' autonomous motivation on learning organic chemistry: A self-determination theory perspective. *Science Education, 84*(6), 740–756. [https://doi.org/10.1002/1098-237X\(200011\)84:6<740::AID-SCE4>3.0.CO;2-3](https://doi.org/10.1002/1098-237X(200011)84:6<740::AID-SCE4>3.0.CO;2-3)
- Cheung, C. S., Pomerantz, E. M., Wang, M., & Qu, Y. (2016). Controlling and autonomy-supportive parenting in the United States and China: Beyond children's reports. *Child Development, 87*(6), 1992–2007. <https://doi.org/10.1111/cdev.12567>
- Chirkov, V. I., & Ryan, R. M. (2001). Parent and teacher autonomy-support in Russian and U. S. Adolescents: Common effects on well-being and academic motivation. *Journal of Cross-Cultural Psychology, 32*(5), 618–635. <https://doi.org/10.1177/0022022101032005006>

- Cooper, H., Lindsay, J. J., & Nye, B. (2000). Homework in the home: How student, family, and parenting-style differences relate to the homework process. *Contemporary Educational Psychology, 25*(4), 464–487. <https://doi.org/10.1006/ceps.1999.1036>
- Currie, C., Zanotti, C., Morgan, A., Currie, D., de Looze, M., Roberts, C. & Barnekow, V. (Eds) (2012). *Social determinants of health and well-being among young people. Health Behaviour in School-aged Children study: International report from the 2009/2010 survey.* Health Policy for Children and Adolescents, No. 6. World Health Organization.
- Darling, N., & Steinberg, L. (1993). Parenting style as context: An integrative model. *Psychological Bulletin, 113*(3), 487–496. <https://doi.org/10.1037/0033-2909.113.3.487>
- Dettmers, S, Yotyodying, S., & Jonkmann, K. (2019). Antecedents and outcomes of parental homework involvement: How to family-school partnerships affect parental homework involvement and student outcomes? *Frontiers in Psychology.* <https://doi.org/10.3389/fpsyg.2019.01048>
- Duineveld, J. J., Parker, P. D., Ryan, R. M., Ciarrochi, J., & Salmela-Aro, K. (2017). The link between perceived maternal and paternal autonomy support and adolescent well-being across three major educational transitions. *Developmental Psychology, 53*, 1978–1994. <https://doi.org/10.1037/dev0000364>.
- Dumont, H., Trautwein, U., Nagy, G., & Nagengast, B. (2014). Quality of parental homework involvement: Predictors and reciprocal relations with academic functioning in the reading domain. *Journal of Educational Psychology, 106*(1), 144–161. <https://doi.org/10.1037/a0034100>
- Eccles, J. S. (2004). *Schools, academic motivation, and stage-environment fit.* In R. M. Lerner & L. D. Steinberg (Eds), *Handbook of adolescent psychology* (pp. 125 – 153). Wiley

- Eccles, J. S., Midgley, C., Wigfield, A., Buchanan, C. M., Reuman, D., Flanagan, C., & Mac Iver, D. (1993). Development during adolescence: The impact of stage-environment fit on young adolescents' experiences in schools and in families. *American Psychologist, 48*(2), 90–101. <http://doi.org/10.1037/0003-066X.48.2.90>
- Eccles, J. S., & Roeser, R. W. (2011). Schools as developmental contexts during adolescence. *Journal of Research on Adolescence, 21*(1), 225–241. <https://doi.org/10.1111/j.15327795.2010.00725.x>
- Falanga, K., Gonida, E., & Stamovlasis, D. (2023). Predicting different types of parental involvement in children's homework: The role of parent motivational beliefs and parent affect. *European Journal of Psychology of Education, 38*, 249–268. <https://doi.org/10.1007/s10212-022-00613-0>
- Farkas, M. S., & Grolnick, W. S. (2010). Examining the components and concomitants of parental structure in the academic domain. *Motivation and Emotion, 34*(3), 266–279. <https://doi.org/10.1007/s11031-010-9176-7>
- Gonida, E. N., & Cortina, K. S. (2014). Parental involvement in homework: Relations with parent and student achievement-related motivational beliefs and achievement. *British Journal of Educational Psychology, 84*(3), 376–396. <https://doi.org/10.1111/bjep.12039>
- Hagger, M. S., Sultan, S., Hardcastle, S. J., & Chatzisarantis, N. L. D. (2015). Perceived autonomy support and autonomous motivation toward mathematics activities in educational and out-of-school contexts is related to mathematics homework behavior and attainment. *Contemporary Educational Psychology, 41*, 111–123. <https://doi.org/10.1016/j.cedpsych.2014.12.002>
- Hascher, T. (2004). Wohlbefinden in der Schule [Well-being at school]. Waxmann

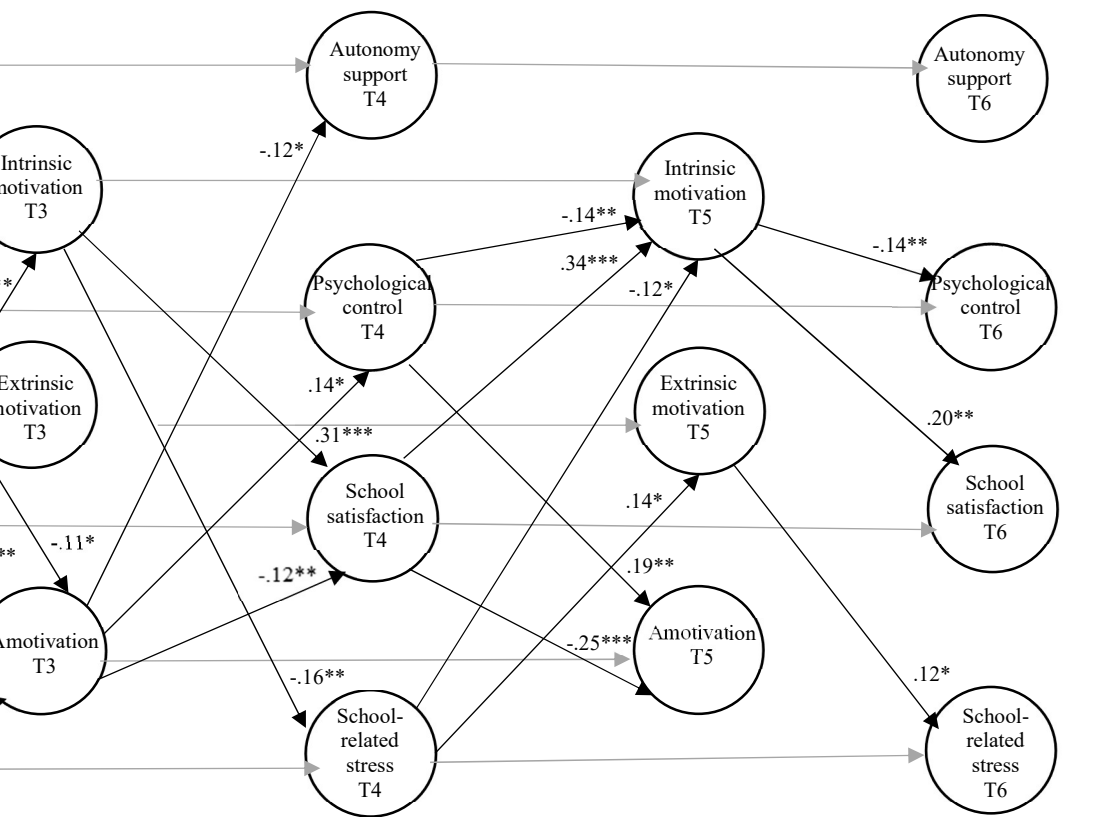
- Hill, N. E., & Tyson, D. F. (2009). Parental involvement in middle school: A meta-analytic assessment of the strategies that promote achievement. *Developmental Psychology, 45*(3), 740–763. <https://doi.org/10.1037/a0015362>
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Karbach, J., Gottschling, J., Spengler, M., Hegewald, K., & Spinath, F. M. (2013). Parental involvement and general cognitive ability as predictors of domain-specific academic achievement in early adolescence. *Learning and Instruction, 23*, 43–51. <https://doi.org/10.1016/j.learninstruc.2012.09.004>
- Katz, I., Kaplan, A., & Buzukashvily, T. (2011). The role of parents' motivation in students' autonomous motivation for doing homework. *Learning and Individual Differences, 21*(4), 376–386. <https://doi.org/10.1016/j.lindif.2011.04.001>
- Kämppi, K., Välimaa R., Ojala, K., Tynjälä, J. Haapasalo, I., Villberg, J., & Kannas, L. (2012). *Koulukokemusten kansainvälistä vertailua 2010 sekä muutokset Suomessa ja Pohjoismaissa 1994-2010 – WHO-koululaistutkimus* [International comparison of school experiences in 2010 and changes in Finland and in the Nordic countries from 1994 to 2010 – The Health Behavior of School-aged Children study]. Finnish National Board of Education, report on monitoring education 2012:8.
- Li, J., Deng, M., Wang, X., & Tang, Y. (2018). Teachers' and parents' autonomy support and psychological control perceived in junior-high school: Extending the dual-process model of self-determination theory. *Learning and Individual Differences, 68*, 20–29. <https://doi.org/10.1016/j.lindif.2018.09.005>

- Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association*, *83*, 1198–1202.
- Liu, Y. (2015). The longitudinal relationship between Chinese high school students' academic stress and academic motivation. *Learning and Individual Differences*, *38*, 123–126.
<https://doi.org/10.1016/j.lindif.2015.02.002>
- Malmberg, L. E. (1996). How do Finnish students prepare for their future in three school types? The relation between content of plans, information gathering and self-evaluations. *British Journal of Educational Psychology*, *66*, 457–469. <http://doi.org/10.1111/j.2044-8279.1996.tb01212.x>
- Manganelli, S., Cavicchiolo, E., Mallia, L., Biasi, V., Lucidi, F., & Alivernini, F. (2019) The interplay between self-determined motivation, self-regulated cognitive strategies, and prior achievement in predicting academic performance, *Educational Psychology*, *39*(4), 470–488. <https://doi.org/10.1080/01443410.2019.1572104>
- Moè, A., Katz, I., & Alesi, M. (2018). Scaffolding for motivation by parents, and child homework motivations and emotions: Effects of a training programme. *The British journal of educational psychology*, *88*(2), 323–344. <https://doi.org/10.1111/bjep.12216>
- Morinaj, J., & Hascher, T. (2019). School alienation and student well-being: A cross-lagged longitudinal analysis. *European Journal of Psychology of Education*, *34*(2), 273–294.
<https://doi.org/10.1007/s10212-018-0381-1>
- Moroni, S., Dumont, H., Trautwein, U., Niggli, A., & Baeriswyl, F. (2015). The need to distinguish between quantity and quality in research on parental involvement: The example of parental help with homework. *The Journal of Educational Research*, *108*(5), 417–431.
<https://doi.org/10.1080/00220671.2014.901283>

- Muthén, L.K., & Muthén, B.O. (1998–2017). *Mplus user's guide* (8th ed.). Muthén & Muthén. Official Statistics of Finland. (2022). *Educational structure of population* [E-publication]. Statistics Finland. http://www.stat.fi/til/vkour/2019/vkour_2019_2020-11-05_tie_001_en.html
- Pekrun, R., & Linnenbrink-Garcia, L. (2012). Academic emotions and student engagement. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 259–282). Springer. https://doi.org/10.1007/978-1-4614-2018-7_12
- Pomerantz, E. M., & Grolnick, W.S. (2017). The role of parenting in children's motivation and competence: What underlies facilitative parenting. In A. J. Elliot, C. S. Dweck & D.S. Yeager (Eds.), *Handbook of Competence and Motivation: Theory and application* (2nd ed., pp. 566–585). Guilford Press.
- Raufelder, D., Hoferichter, F., Ringeisen, T., Regner, N., & Jacke, C. (2015). The perceived role of parental support and pressure in the interplay of test anxiety and school engagement among adolescents: Evidence for gender-specific relations. *Journal of Child and Family Studies*, 24(12), 3742–3756. <https://doi.org/10.1007/s10826-015-0182-y>
- Raven, J. (1981). Manual for Raven's progressive matrices and Mill Hill vocabulary scales. Psychologists Press.
- Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, 57, 749–761.
- Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, 61. <https://doi.org/10.1016/j.cedpsych.2020.101860>

- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Press.
- Salmela-Aro, K., & Upadaya, K. (2014). School burnout and engagement in the context of demands – resources model. *British Journal of Educational Psychology*, *84*(1), 137–151. <https://doi.org/10.1111/bjep.12018>
- Sameroff, A. (2010). A unified theory of development: A dialectic integration of nature and nurture. *Child Development*, *81*(1), 6–22. <https://doi.org/10.1111/j.1467-8624.2009.01378.x>
- Scarr, S., & McCartney, K. (1983). How people make their own environments: A theory of genotype greater than environment effects. *Child Development*, *54*(2), 424–435. <https://doi.org/10.2307/1129703>
- Silinskas, G., Leppänen, U., Aunola, K., Parrila, R., & Nurmi, J.-E. (2010). Predictors of mothers' and fathers' teaching of reading and mathematics during kindergarten and Grade 1. *Learning and Instruction*, *20*(1), 61–71. <https://doi.org/10.1016/j.learninstruc.2009.01.002>
- Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological Science*, *22*(11), 1359–1366. <https://doi-org/10.1177/0956797611417632>
- Soenens, B., Vansteenkiste, M., & Luyten, P. (2010). Toward a domain-specific approach to the study of parental psychological control: distinguishing between dependency-oriented and achievement-oriented psychological control. *Journal of personality*, *78*(1), 217–256.

- Trautwein, U., Lüdtke, O., Schnyder, I., & Niggli, A. (2006). Predicting homework effort: Support for a domain-specific, multilevel homework model. *Journal of Educational Psychology, 98*(2), 438–456. <https://doi.org/10.1037/0022-0663.98.2.438>
- Tunkkari, M., Aunola, K., Hirvonen, R., Silinskas, G., & Kiuru, N. (2021). The interplay between maternal homework involvement, task-avoidance, and achievement among adolescents. *Journal of Family Psychology, 35*(7), 863–874. <https://doi.org/10.1037/fam0000686>
- Vansteenkiste, M., Ryan, R. M., & Soenens, B. (2020). Basic psychological need theory: advancements, critical themes, and future directions. *Motivation and Emotion, 44*(1), 1–31. <https://doi.org/10.1007/s11031-019-09818-1>
- Wilks, S. E. (2008). Resilience amid academic stress: The moderating impact of social support among social work students. *Advances in Social Work, 9*, 106–125. <https://doi.org/10.18060/51>
- Yang, M., Viladrich, C., Cruz, J., (2022). Examining the relationship between academic stress and motivation toward physical education within a semester: A two-wave study with Chinese secondary school students. *Frontiers in Psychology, 13*. <https://doi.org/10.3389/fpsyg.2022.965690>
- Yotyodying, S. (2012). *The quality of parental home-based involvement: Antecedents and consequences in German and Thai families*. Dissertation.



Grade 7 (spring) Upper secondary school Grade 9 (fall) Lower secondary school Grade 9 (spring) Lower secondary school First year of upper secondary education (fall)

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