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The Role of Social and Emotional Competencies in Academic Efficacy Beliefs, Emotional Distress, and Academic Stress

A Study Among Lower Secondary School Students

PhD: Thesis UiS No. 637

The Role of Social and Emotional Competencies in Academic Efficacy Beliefs, Emotional Distress, and Academic Stress

A Study Among Lower Secondary School Students

By

Lene Vestad

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If I have the belief that I can do it, I shall surely acquire the capacity to do it even if I may not have it at the beginning

Mahatma Gandhi

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Stavanger, January 2022 Lene Vestad

Summary

Background: Adolescence is a time of significant social and emotional changes, including changes in school and learning environment. Adolescents report high levels of academic stress, and mental health difficulties typically surface during this period of life. Furthermore, adolescents' expectancies, beliefs, and persistence regarding their schoolwork tend to decrease in lower secondary school. The stimulation of students' social and emotional competencies (SECs) has previously been shown to lower emotional distress, nurture academic performance, and build resilience in students. However, research on stimulating SEC has primarily been conducted among younger students. Moreover, relatively little is known about how specific SECs is related to academic efficacy beliefs (AEB), emotional distress, and academic stress during early adolescence.

Aims: The overall aims and main research question of this thesis was how students perceive their SECs, and how they are related to AEB and emotional distress, as well as how SECs are experienced and whether they help coping with academic stress during the first year of lower secondary school.

Moreover, this thesis is article based and consists of three studies:

Study I had a cross sectional design and aimed to investigate the associations between relationship skills, emotional regulation, and structuring of school and homework with AEB and emotional distress. AEB had the role of an intermediate variable. *Study II* had a longitudinal design and investigated intraindividual changes in perceived relationship skills, emotional regulation, AEB, as well as perceived classroom relations i.e., emotional support from teachers, and collaborative peer relations changed during the first year of lower secondary school. This study also tested relationships between these changes by use of two structural models, where perceived relationship skills and emotional regulation through cognitive reappraisal were independent variables, perceived classroom relations intermediate variables and AEB dependent variable. *Study III* used focus group interviews to explore how an educational intervention addressing relationship skills, emotional regulation, mindfulness, growth mindset, and problem-solving was experienced by eighth grade

students, and particularly to what degree the different components of the intervention helped students cope with academic stress.

*Method*s: *Studies I* and *II* were quantitative and used students' responses to questionnaires as data sources. Survey data was collected at two time-points: T1 in September 2018 and T2 in March 2019 in grade eight. S*tudy I* used data from T1 and structural equation modeling (SEM) with latent variables implemented as the analytic tool. Multi-group analysis was used to inspect whether gender differences moderated the structural associations. *Study II* used data from the T1 and T2, and a latent change score (LCS) approach was implemented. *Study III* was a qualitative embedded single case study in which data were derived from three focus groups. The informants were adolescent students who had participated in ROBUST. A qualitative conventional content analysis was used to analyze the data.

Results: In *study I,* relationship skills, emotional regulation, planning schoolwork, and structuring homework were cross sectionally associated with AEB. Moreover, high perceived relationship skills, emotional regulation, and AEB were associated with low emotional distress. Indirect associations may reflect that these SECs could play a role in reducing emotional distress via improving AEB. Perceived good relationship skills, emotional regulation, and structuring of homework had a stronger association with less emotional distress among females than male student. Emotional regulation and structuring of homework were also more strongly related to AEB among adolescent females.

Study II's results indicate that relationship skills, emotional regulation, AEB, and classroom relations on average decrease during the first year of lower secondary school. The strongest decline was observed for emotional support from teachers and collaborative peer relations, whereas the weakest decline occurred for perceived relationship skills and emotional regulation. However, significant individual variations in change were found for all variables. The LCS structural model showed a strong and direct association between intra individual changes in emotional regulation and AEB. Links also occurred for changes in relationship skills with collaborative peer relations and emotional support from teachers and via this with AEB. Indirect associations were found for the SECs via classroom relations with AEB.

Results from *study III* suggest that students perceived the SECs mindfulness, problem-solving, and growth mindset as helpful means of coping with academic stress. Emotional regulation and relationship skills were perceived as more challenging to utilize.

Conclusions: Findings of this thesis suggest that the SECs relationship skills, emotional regulation through cognitive reappraisal, AEB, and classroom relations all decrease on average during the first year of lower secondary school. This further indicate a need for nurturing students SECs to support a more positive development. In this regard, students perceived relationship skills, emotional regulation through cognitive reappraisal, and planning and structuring schoolwork are likely to have a role in students' AEB in the beginning of lower secondary school. Moreover, positive AEB, perceived relationship skills, and emotional regulation may all serve to reduce emotional distress. Added to this, the findings also propose that during the first year of lower secondary school adequate emotional regulation through cognitive reappraisal may engender growth in AEB, and more positive development of relationship skills can enhance AEB via good collaborative peer relations and emotional support from teachers. Students' relationship skills may support the establishment of quality relations in the classroom that promote AEB and protect against emotional distress. Emotional regulation through cognitive reappraisal may aid in students' academic learning activities and facilitate more optimistic emotions that bolster their AEB. This further suggests that stimulating students' emotional regulation and relationship skills is key for growth in adolescents' AEB.

However, a part of this thesis involved the development, piloting and adjustment of an educational intervention that stimulated students SECs in lower secondary school. The students who participated perceived the SECs emotional regulation and relationship skills as more challenging to utilize. Emotional experiences may be stronger and more negative in adolescence. Social relations may also be perceived as more demanding, and together the findings may reflect a need for adolescent students to gain more practical experience of these SECs to be perceived as supportive. Nevertheless, the young perceived mindfulness as reducing negative thinking about academic work by promoting a more accepting attitude toward stressful experiences. Problem-solving was perceived as supporting active efforts to cope with

academic stress, and a growth mindset may have the potential to enhance optimism that supports beliefs about coping with challenging academic work. Thus, the findings support the notion that nurturing SECs can build resilience in adolescent students.

List of articles

Study I

Vestad, L., Bru, E., Virtanen, T., Stallard, P.N. (2021). Associations of social and emotional competencies, academic efficacy beliefs, and emotional distress among students in lower secondary school. *Social Psychology of Education,* 24*(1)*, 413-439. https://doi.org/10.1007/s11218-021-09624-z

Study II

Vestad, L., Bru, E., Virtanen, T. (In revision). Changes in academic efficacy beliefs in the first year of lower secondary school. Is it related to changes in social and emotional competencies? *Educational Psychology. An International Journal of Experimental Educational Psychology.*

Study III

Vestad, L., Tharaldsen, K. T. (2021). Building social and emotional competencies for coping with academic stress among students in lower secondary school. *Scandinavian Journal of Educational Research.* https://doi.org/10.1080/00313831.2021.1939145

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1 Introduction

Declining mental health in youth populations hinders individual well-being and may lead to negative and stressful experiences in relation to school (Fink et al., 2015; Moksnes et al., 2016; Potrebny et al., 2019). Mental health difficulties in adolescents have increased in recent decades (Bakken, 2018, 2019; Bakken et al., 2018; Fink et al., 2015; von Soest, 2012). The transition from primary to lower secondary school has been identified as a critical time during which such difficulties emerge (Rodríguez-Naranjo & Caño, 2016). Today's adolescents report disturbingly high levels of stress regarding their academic performance and achievement (Moksnes et al., 2016; Pascoe et al., 2020). Perceived stress and emotional reactions thereto may lead to emotional distress, thereby causing behavioral changes and affecting relationships to the extent that it influences students' daily academic functioning (Kieling et al., 2011; Moksnes et al., 2014; Von Soest et al., 2020). A moderate decline in positive feelings toward school is also known to occur during adolescence (Symonds & Hargreaves, 2016) along with a decline in motivation and expectations regarding schoolwork (Gnambs & Hanfstingl, 2016; Skaalvik & Federici, 2015; Yeager et al., 2017). Adolescents may find school to be a source of stress that affects their expectations about schoolwork and leads to emotional distress (Eriksen et al., 2017; Kaplan et al., 2005).

To promote positive functioning in adolescence, research should focus on factors that may work as resources that help mitigate potential stressful experiences (Moksnes et al., 2016). One factor that may support positive development in this period is students' social and emotional competencies[1]

[1]SEC can be defined as the social and emotional skills, knowledge, and attitudes necessary to set goals, manage behavior, and build relationships as well as to process and remember information within settings that can nurture these competencies (Jones & Kahn, 2017). SEC broadly concerns the ability to understand, manage, and express the social and emotional aspects of one's life (Dias et al., 1996). The definition is directly linked to the term social and emotional learning (SEL), which is the process through which a person acquires and applies knowledge, skills, and attitudes to develop healthy identities, manage emotions, and achieve personal and collective goals and to

(SECs). Research has indicated that good SECs are effective in reducing psychosocial problems (Domitrovich et al., 2017; Greenberg et al., 2017; van de Sande et al., 2019) and students who have higher SECs during the first year of lower secondary school are suggested to report fewer mental health challenges in their second year (Panayiotou et al., 2019). Good SECs are also known to support learning and performance in school (Bierman et al., 2010; Davidson et al., 2018; Domitrovich et al., 2017) and to have a positive impact on classroom relationships (Allen et al., 2017). Hence, having good SECs may improve an individual's chances of success in school and later in life (Clarke et al., 2015; Corcoran et al., 2018; Taylor et al., 2017; Weare & Nind, 2011). Accordingly, the development of SECs may be of central importance in adolescence owing to the individual's malleability during this period that can contribute to creating a foundation for work-related and social functioning in the present as well as later adulthood (Steinberg, 2005).

The stimulation of students' SECs is therefore suggested to be key for their positive development (Durlak & Weissberg, 2011; Durlak et al., 2011; Sklad et al., 2012; Taylor et al., 2017; Wigelsworth et al., 2016) as well as for students' effort, persistence, and learning in school (Dweck & Yeager, 2019; Yeager, 2017). Moreover, schools have been identified as central sites for the development of students' SECs (Durlak & Weissberg, 2011; Greenberg et al., 2017; Panayiotou et al., 2019; Weissberg et al., 2015). Within the last two decades, educators, policymakers, and scientists have agreed that schools should foster student's SECs (Corcoran et al., 2018; Domitrovich et al., 2017; Weissberg et al., 2015). The NOU 2015:8 actualized the development of SECs among Norwegian school students.

One approach to fostering students' SECs in school is through universal school-based social and emotional learning (SEL) interventions. Results from meta-analyses indicate that when successfully implemented, these interventions can contribute to a range of salient outcomes (Domitrovich et al., 2017; Weissberg

feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions (CASEL, n. d). Thus, SEL is characterized as the process through which SEC develops (Domitrovich et al., 2017).

et al., 2015). For example, a meta-analysis by Durlak et al. (2011), based on 213 school-based universal SEL interventions from kindergarten through high school, found that the effects significantly improved students' SECs and reduced emotional distress (Durlak et al., 2011). Other meta-analytical reviews indicate that universal school-based SEL interventions improve students' SECs, prosocial behavior, and academic performance (e.g., Sklad et al., 2012) and that the effects can last for up to four years post-intervention (Taylor et al., 2017).

Although these meta-analytic findings provide empirical evidence for SEL interventions' effectiveness, most of these studies relied heavily on data from kindergarten and elementary school students (Durlak et al., 2011; Jagers et al., 2015; Sklad et al., 2012). More knowledge about the role and development of SECs in adolescence is required (Jagers et al., 2015; Ross et al., 2019; Tarbetsky et al., 2017). More needs to be known about the stimulation of students' SECs during the first year of lower secondary school (Ross & Tolan, 2018) and whether specific SECs are associated with students' academic efficacy beliefs (AEB), whether they play a role in reducing emotional distress, and whether they help students cope with academic stress (van de Sande et al., 2019; Ross et al., 2019). Expanded knowledge regarding these matters can inform future research and politicians and practitioners about the potential ways in which adolescent students' school functioning, learning, and mental well-being can be supported.

This thesis aims to contribute knowledge to research on how specific SECs' relationship skills, emotional regulation, planning and structuring of schoolwork, and AEB are related to emotional distress at the beginning of lower secondary school. AEB is considered a SEC as well as having a role as an intermediate variable (*study I*). The thesis also aims to investigate whether the development of the individual changes in relationship skills, emotional regulation, and changes in classroom relations (emotional support from teachers and collaborative peer relations) are related to change in AEB across the first year in lower secondary school (*study II*). *Study III* supplements *studies I* and *II* and explores whether students in early adolescence perceive learning about the SECs relationship skills, emotional regulation, mindfulness, growth mindset, and problem-solving as useful and whether it support their coping with academic stress.

Based on the three studies, this thesis is guided by the following main research question:

How do students perceive their social and emotional competencies, and how are these competencies related to academic efficacy beliefs, and emotional distress, as well as how they are experienced and whether they help coping with academic stress during the first year of lower secondary school?

2 Theoretical framework

This chapter first outlines the challenging factors of emotional distress (*study I*), academic stress (*study III*), and deteriorating AEB (*studies I* and *II*) that may emerge in adolescence. The SEC concept and SECs' role in coping are presented. A more fine-grained definition of each SEC is provided thereafter. Finally, the universal and school-based SEL pilot intervention named ROBUST is introduced (*study III*).

2.1 Emotional distress, academic stress, and deteriorating academic efficacy beliefs as challenges in adolescence

In this section, the main outcome variables of this thesis are introduced. Challenges of emotional distress among adolescents are first outlined. Academic stress is then explained. Finally, AEB in adolescence is elaborated on.

2.1.1 Emotional distress

In recent decades, increased emotional distress has been reported among adolescent students (Bakken, 2018, 2019; Bakken et al., 2018; Bor et al., 2014). Emotional distress denotes unpleasant emotional reactions that can influence students' levels of functioning (Kim, 2021; Schroder et al., 2017; Strand et al., 2003). High levels of emotional distress involve symptoms of anxiety and depression as indicators of possible mental health difficulties (Kleppang & Hagquist, 2016; Lien et al., 2010) that may have detrimental impacts on education and health (Collishaw, 2015). A continuous rise in perfectionism among the young is related to high expectations to perform well in school and places education among one of the main sources of stress (Bakken, 2018, 2019; Suldo et al., 2009) that can ultimately lead to emotional distress (Curran & Hill, 2019).

2.1.2 Academic stress

Stress is characterized as an individual's experience of pressure whereby a discrepancy exists between the demands that the situation imposes, and the resources perceived as available (Lazarus & Folkman, 1984; Wubbels & Brekelmans, 2005). Under academic stress, the individual will perceive achievement and schoolwork as particularly demanding (Byrne et al., 2007). The speed and magnitude with which changes occur during adolescence are believed to exceed the student's capacity to cope, thus leading to stress (Moksnes et al., 2014). This aligns with previously reported empirical results indicating that adolescent students experience tension in relation to studying and report high levels of academic stress (Eriksson et al., 2019; Moksnes & Reidunsdatter, 2019; Potrebny et al., 2019).

Students' perceived academic stress will likely challenge their motivation and expectations about learning as well as their beliefs in their own ability to cope with learning activities (Moksnes et al., 2016; Pascoe et al., 2020; Ursin et al., 2020). As daily stressors are among the primary reasons for emotional distress (Rodríguez-Naranjo & Caño, 2016) and typically surface during adolescence (Reneflot et al., 2018), the increase in school-related stress is of serious concern.

2.1.3 Academic efficacy beliefs

Adolescent academic motivation is considered essential for the learning process (Dweck & Yeager, 2019; Patrick et al., 2011; Yeager et al., 2019). Students' academic motivation involves their mindset and efficacy beliefs (Lee et al., 2019; Pajares et al., 2007) conceptualized as AEB and considered an aspect of students' self-awareness (Durlak et al. 2011). In this respect, AEB is seen as a SEC and defined as one's belief in one's ability to accomplish challenging tasks and the conviction that one's ability can be enhanced with effort (Gaumer Erickson et al., 2016).

AEB is conceptually based on both social cognitive theory and the self-efficacy concept (Bandura, 1997) as well as the incremental theory of growth mindset (Dweck & Sorich, 1999). These theories all concern students' beliefs about

their abilities to cope with challenging schoolwork (Dweck, 1999; Bandura, 1997).

Self-efficacy constitutes a student's confidence in their ability to engage in the requisite behavior for a desired academic outcome (Maddux & Kleiman, 2016) and is known to support motivation and personal accomplishment (Pajares et al., 2007) in addition to buffering against perceived academic stress (Zajacova et al., 2005). Four main sources are considered to support students' self-efficacy beliefs (Bandura, 1997; Pajares et al., 2007): mastery experiences, whereby students' earlier performances support their engagement in current and subsequent academic tasks (Bandura, 1978); vicarious experiences, wherein students observe modeling by others; social persuasion from others encompasses envisioning attainable success; and physiological and emotional states encompass various stress or mood states that may provide cues relating to success or failure in adolescent students (Pajares et al., 2007). Of these four main sources, mastery experiences have been demonstrated to be the strongest predictor of self-efficacy beliefs in adolescence (Britner & Pajares, 2006; Pajares et al., 2007) while the others are suggested to be somewhat less influential on self-efficacy beliefs regarding academic ability (Anderson & Betz, 2001).

Students' efficacy beliefs are suggested to be subject-specific (Pajares et al., 2007). However, research also suggests that mastery experiences are likely to engender more general efficacy beliefs across school subjects and situations (Beatson et al., 2020; Schunk & Pajares, 2002). Furthermore, these experiences are known to be related to the growth mindset concept owing to the notion that ability is developed through effort and perseverance (Bandura, 1997) and that attributes such as personality and intelligence are malleable (Yeager & Dweck, 2012; Yeager et al., 2019). Thus, AEB involves self-efficacy beliefs and growth mindsets that play a role in students' education.

Notwithstanding the importance of AEB, when students enter lower secondary school, their academic motivation is typically challenged and likely to decrease (Eccles, 2004; Eccles & Roeser, 2009; Gnambs & Hanfstingl, 2016; Gottfried et al., 2007). This may be associated with increased academic demands and obligation to engage in more independent learning (Eccles, 2004). The establishment of new relationships with teachers and peers may also be

experienced as stressful and may reduce students' efficacy beliefs and motivation about schoolwork (Gnambs & Hanfstingl, 2016).

Hence, positive AEB may have the potential to mitigate students' emotional distress by promoting their belief in their ability to accomplish challenging schoolwork and thereby help them cope better with the situation. Furthermore, growth in AEB may be related to changes in classroom relations and the development of SECs among the young.

2.2 Social and emotional competencies, stress, and coping in the academic context

Over time, academic stress may lead to emotional distress and a deterioration in AEB. However, diminished AEB also escalates the risk of increased stress and proposes that these relations are potentially reciprocal, hence making the educational context a highly legitimate target for students' everyday efforts to cope with perceived stress (Skinner et al., 2013; Zimmer-Gembeck & Skinner, 2016). According to transactional theory (Lazarus & Folkman, 1984), the perception of stress and one's ability to cope with it is a product of how the individual appraises the transaction between themselves and the surrounding environment (Lazarus, 1999). The coping process thus concerns cognitive and/or behavioral efforts to handle situations that are perceived as taxing or exceeding personal resources and thereby endangering well-being (Biggs et al., 2017; Compas et al., 2001; Compas et al., 2017; Lazarus, 1999). The perception of oneself as coping with everyday stress is likely to protect against emotional distress as well as affect students' academic expectations.

Student SECs are related to the process of coping (Pang et al., 2018; Skinner & Wellborn, 1997; Skinner & Zimmer-Gembeck, 2007). SECs and coping are further shown to work in interactive processes that involve emotions, behavior, cognition, and regulatory efforts in relational or environmental situations (Frydenberg & Lewis, 2000; Pang et al., 2018; Skinner & Wellborn, 1997; Skinner & Zimmer-Gembeck, 2007). These processes are believed to be changeable features affected by personal and environmental resources that can be adjusted (Seiffge-Krenke, 2012; Seiffge-Krenke & Klessinger, 2000; Skinner & Zimmer-Gembeck, 2007).

Students' ability to cope as well as their appraisals concern the personal and environmental resources that are related with their SECs (Pang et al., 2018; Skinner & Zimmer-Gembeck, 2007). Appraisals constitute considerations of a situation's motivational relevance and congruence (Smith & Kirby, 2009): for example, the appraisal of a situation as challenging includes focusing on success or the social benefits and personal growth that the situation has the potential to bring forth. However, a situation incongruent with personal needs or goals may be appraised as a threat, a challenge, or a loss (Lazarus, 1999). Loss denotes the damage or harm that has occurred and, in the school context, may concern failure in an exam, feeling isolated from one's peers, or even the loss of valuable peer relationships. Appraisals of threat may influence personal well-being, and both appraisal types may engender perceptions of stress that are associated with increased emotional distress (Moksnes et al., 2014; Pang et al., 2018).

SEC, however, is characterized as a broad concept with several interrelated skills (Domitrovich et al., 2017; Durlak & Weissberg, 2011; Shriver & Weissberg, 2020). Scholars have attempted to devise more precise descriptions of the most relevant competencies (Berg et al., 2017). In the broadest sense, SEC may be described as the foundation that allows students to engage with others as well as to better handle stress associated with mental, emotional, and academic health (Collie, 2020; Osher et al., 2016). Accordingly, SEC includes the balance between the intra- and interpersonal goals (Rose-Krasnor & Denham, 2009) that develop in an interplay between the person and environment that may have the potential to function as resources that support students to cope at school.

The Collaboration for Academic, Social and Emotional Learning (CASEL, n. d) proposed a conceptualization of SECs that groups them into the five broad empirical domains of self-awareness, self-management, social awareness, relationship skills, and responsible decision making (Durlak et al., 2011; Elias et al., 1997; Taylor et al., 2017).

This thesis focuses on aspects of the three domains of self-awareness, self-management, and relationship skills. Self-awareness is represented by AEB and growth mindset, whereas planning and structuring of schoolwork, emotional regulation, mindfulness, and problem-solving are all considered to be aspects

of self-management. Relationship skills refers to students' perceptions with respect to establishing contact with others, communicating effectively, and seeking social support when needed.

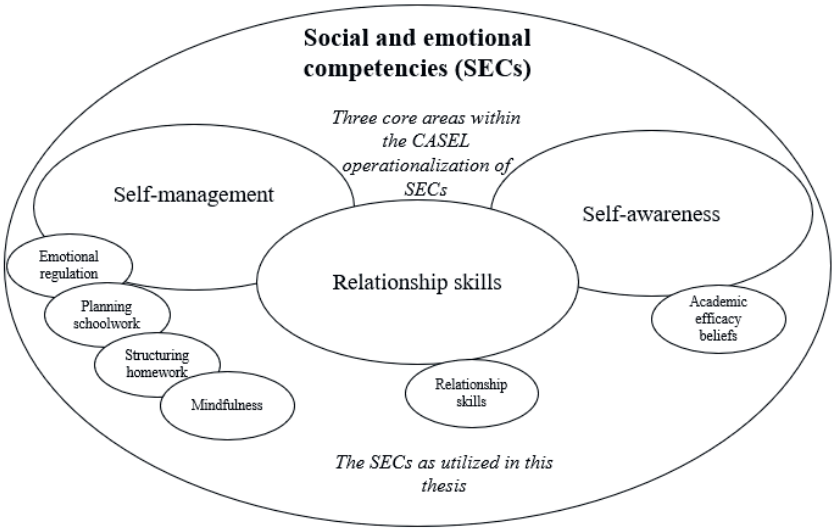

Figure 1 Conceptualization of the link between social and emotional competencies as defined in CASEL and how they are operationalized in this thesis.

2.2.1 SECs as coping resources

A recent systematic review highlighted SECs' importance in adolescence and included among its main findings that the stimulation of optimism and growth mindset with respect to schoolwork is crucial for well-being and psychosocial functioning (van de Sande et al., 2019). This may support earlier assertions that adopting a growth mindset with respect to schoolwork is likely to positively influence appraisals of one's ability to cope with challenging learning activities (Yeager et al., 2018; Yeager & Dweck, 2012).

Furthermore, and considering the increase in adolescents' academic stress, SECs such as the planning and structuring of school and homework as well as solving problems relating to academic work may support the coping process via a problem-focused strategy of managing the problem directly by changing

the elements that contributed to the stressful situation (Berjot & Gillet, 2011; Skinner & Zimmer-Gembeck, 2007). This has been shown to reduce stress and support mental health in adolescence (Cicognani, 2011; Lee et al., 2019).

Students' relationship skills are suggested to be central to better managing relational challenges in the context of school (Bierman et al., 2010) and to play a role in the establishment of supportive peer relations (Durlak et al., 2011; Taylor et al., 2017). As relationship skills also include seeking social support for advice, assistance, or information from classmates and/or teachers, it may concern actively solving the situation at hand (Carver & Scheier, 2017; Carver et al., 1989). Thus, to perceive oneself able to seek social support is regarded as an important factor in establishing relationships as a buffer against perceived stress (Thoits, 2011).

The ability to regulate one's emotions for adequate management of emotionally activating situations (Eisenberg & Sulik, 2012) is considered to be among the key socio-emotional competences, as it allows flexibility in emotionally activating situations (Frydenberg & Lewis, 2000). Emotional regulation is also linked to adequate emotion-focused coping strategies whereby one changes the way in which one perceives a situation to reduce the situation's association with stress (Skinner & Zimmer-Gembeck, 2007). However, emotion-focused coping may occasionally lead to avoidant or even suppressive coping strategies (Biggs et al., 2017). When used over a prolonged period, it may hinder action-oriented coping efforts (Carver et al., 1989) and lead to emotional distress (Eschenbeck et al., 2018). Nevertheless, growth in cognitive skills and increased recognition of emotions in adolescence are believed to support more advanced emotion-focused coping among the young (Skinner & Zimmer-Gembeck, 2007).
Moreover, SEL interventions based on mindfulness are thought to stimulate attention and are likely to enhance focus and work as a resource for adequate emotion-focused coping and emotional regulation (Donald & Atkins, 2016; Kobayashi et al., 2020; Schonert-Reichl et al., 2015; Shapiro & Carlson, 2009; Weare, 2012). Overall, the SECs presented may function as resources that support students' problem- and emotion-focused strategies for coping in the school context.

The sections that follow further elaborate each SEC and their roles as potential coping resources.

2.2.2 Relationship skills

Relationship skills concern one's perception of being able to establish and maintain relationships with others as well as having access to social support (Rose-Krasnor & Denham, 2009; Rose & Rudolph, 2006; Rubin et al., 2006). The social ties and support networks that students establish in school are associated with good mental health (Durlak & Weissberg, 2011; Rubin et al., 2011). By contrast, the perception of oneself as being deficient in relationship skills is associated with increased stress, which over time may lead to emotional distress (Rose & Rudolph, 2006). Moreover, research suggests that the establishment of quality relationships is linked to adequate coping in social contexts (Eckenrode, 2013) and thereby supports individuals' beliefs, expectations, and motivation at school (Greenberg et al., 2017; Yeager, 2017).

Social support is characterized by direct instrumental and indirect emotional efforts to adjust to the stressor at hand (Thoits, 2011). It is considered one of the most important factors influencing mental health during adolescence (Folkman, 2008; Ronen et al., 2016; Rueger et al., 2016). Moreover, social support is a resource that individuals perceive as available or provided to them in interaction with others (Gottlieb & Bergen, 2010; Thoits, 2011). Two models have been proposed to explain the mechanisms of social support. The main effect model implies a direct effect on mental health from social support (Ringdal et al., 2020). The buffering-effects model, on the other hand, proposes that social support can act as a buffer against the effects of perceived stress (Lakey & Cohen, 2000). Both models contribute to the understanding of how social support can facilitate resources, but the buffering-effects model hypothesizes that seeking and receiving social support from classmates and teachers contribute to adequate coping (Thoits, 2011; Skinner & Wellborn, 2011). Students' perceived ability to seek social support may thus assist them in coping with both low- and high-stress conditions (Stroebe et al., 2005).

Despite several inconsistent findings relating to the buffer hypothesis (Murberg & Bru, 2009; Ringdal et al., 2020), the buffering effect of perceived social

support (i.e., the amount of support that individuals perceive as available to them compared to the actual received support) is believed to reduce stress and thereby support adolescent mental health (Szkody & McKinney, 2019). This is further supported by a recent meta-analytic review of 341 articles that found that seeking social support was associated with reduced emotional distress and that perceived peer group support is more strongly related to good mental health than social support from close friends (Rueger et al., 2016). Thus, the perceived ability to establish relationships within a larger network of supportive relations, such as in good and safe learning environments, may provide a sense of predictability and thereby support adequate coping.

Peer relations are becoming increasingly important in adolescence (Wentzel, 2017; Wentzel et al., 2016), and students who relate well to their peers and teachers in the classroom are shown to experience enhanced well-being and motivation (Ryan & Deci, 2020; Wang et al., 2019). However, research also suggests that the perception of oneself as having less optimal relationship skills during adolescence is associated with dysfunctional coping strategies, enhanced stress, and sometimes more substantial mental challenges (de Minzi, 2006; Zhang, 2013). Having adequate relationship skills may therefore support social interactions as a coping resource (Wong & Power, 2019; Zeidner & Matthews, 2016).

2.2.2.1 Development of relationship skills in adolescence

Relationship skills are believed to improve in adolescence (Ross & Tolan, 2018). However, a downward trend in the quality of relationship skills over the same adolescent period may suggest that increasing social demands create a need to stimulate students' relationship skills (Ross et al., 2019). Moreover, the reorganization of the brain's structure during adolescence fuels the desire for social adaptation and acceptance among one's peers (Blakemore & Mills, 2014). One's self-appraisal improves during adolescence and, compared to younger children (Schunk & Pajares, 2002), a more realistic self-appraisal may affect students' perceived relationship skills less adequately (Blackwell et al., 2007). Accordingly, the lower secondary school environment may prompt a decline in students' perceived relationship skills. A more positive perception of one's relationship skills may work as coping resources (Skinner & Zimmer-Gembeck, 2007) and enable supportive classroom relations that contribute to

more optimistic beliefs and expectations about managing challenging schoolwork.

2.2.2.2 Gender differences concerning relationship skills

Empirical findings suggest that females report higher levels of perceived relationship skills than males (Colarossi & Eccles, 2003; Rueger et al., 2016). Females are also known to exhibit more prosocial behavior during adolescence (Rose et al., 2011). Nonetheless, it has been suggested that females engage more frequently in social comparison and that conflicts in female relationships are associated with higher risk for emotional distress compared to males (Rose & Rudolph, 2006). Interpersonal problems among females may create a need for confidence in their ability to establish and maintain relationships (Rudolph et al., 2008).

By contrast, relationships among male peers are characterized by physical activities, games, and competition whereas female relationships involve sharing emotional experiences and self-disclosure that may require individuals to have more advanced relationship skills to feel socially related and supported which then may lower the risk of developing emotional distress (Rose & Rudolph, 2006; Chaplin & Aldao, 2013).

2.2.3 Emotional regulation

Owing to the interconnectedness between emotions and behavior, emotional regulation is closely related to students' relationship skills and encompasses the ability to identify, regulate, and modify emotional reactions (Thompson et al., 2008). Gross (1998, 2014) defines emotional regulation as a process wherein the regulation is either conscious or unconscious, automatic, or controlled as well as effective or ineffective. Accordingly, the cycle of emotional regulation begins with an identified discrepancy between the emotional state a person desires and their actual state, which then creates an opportunity for regulation (Gross, 2014). Emotional regulation is therefore regarded as an integral aspect of the coping process (Skinner & Zimmer-Gembeck, 2007) in which the antecedent strategies of emotional identification and cognitive reappraisals are central (Gross & John, 2003). In this thesis, therefore, emotional regulation

concerns the ability to cognitively reappraise the way in which one thinks about a situation by altering the emotionally activating experience (Flouri & Mavroveli, 2013; Strain & D'Mello, 2015).

Cognitive reappraisal is found to be a malleable feature that can be modulated to the desired outcome as constructive thoughts, feelings, and behavior (Gross, 2014). Furthermore, a link is suggested between cognitive reappraisal and downregulation of stressful situations (Gross, 2014; Gross & John, 2003; Thompson et al., 2008). Indeed, cognitive reappraisal is believed to be one of the most influential processes linking cognition and emotion (Koole, 2009). However, inability to clearly identify activated emotions may lead to poor emotional regulation associated with stress and mental health challenges in adolescence (Ciarrochi et al., 2008; Flouri & Mavroveli, 2013).

The ability to regulate emotions through cognitive reappraisal is considered a key SEC that provides flexibility in emotionally activating situations (Young et al., 2019). When individuals can identify their emotions and apply cognitive reappraisal as a means of changing how they perceive emotionally activated situations, their current emotional experiences may be affected as well as the broader emotional, cognitive, and interpersonal functioning (Gross & John, 2003; Gross, 2014). Moreover, the use of cognitive reappraisal is associated with reduced emotional distress (Aldao et al., 2010; Garnefski & Kraaij, 2006; Gross, 1998). By contrast, less adaptive emotional regulation strategies are associated with higher levels of distress (Aldao et al., 2010). Specific disruptions in the cognitive reappraisal process are suggested to predict future psychopathology in adolescents (Young et al., 2019), reflecting the importance of emotional regulation as a means of coping with stressful events.

Educational settings may engender positive emotions, such as pride, enjoyment, and hope, but they also provide the context for negative emotions, such as boredom and hopelessness, which can affect academic expectations, performance, and achievement in school (Pekrun & Linnenbrink-Garcia, 2012). As students' emotions are known to shape their memory and the cognitive resources that are activated during learning (Pekrun, 2016; Pekrun et al., 2007), the use of cognitive reappraisal is thought to be associated with enhanced learning and memory in education (Davis & Levine, 2013). The ability to cognitively reappraise negative emotions regarding learning may facilitate

greater optimism that strengthens students' AEB. Positive academic emotions have been further shown to increase the investment of effort in the task at hand and enhance academic motivation (Pekrun et al., 2010). In alignment with this, the control–value theory of achievement emotions (Pekrun et al., 2007) proposes that students' appraisals of value and control in learning function as proximal antecedents of emotions that affect cognitive and motivational processes (Putwain et al., 2020).

Accordingly, the appraisal of learning activities as controllable supports learning and shapes choices, effort, and persistence as well as emotions (Pekrun & Perry, 2014). Hence, the ability to cognitively reappraise emotionally activating situations more constructively may create a sense of control with respect to academic work and support collaborative relationships pertaining to learning, which are known to affect motivation and effort in school (Järvelä et al., 2010; Pekrun, 2017).

Although the role of cognitive reappraisal in students' emotions about learning and academic achievement is described as unidirectional, emerging empirical evidence supports a reciprocal relationship between emotions, achievement, and performance in school (Pekrun, 2016; Pekrun & Perry, 2014; Pekrun et al., 2017; Putwain et al., 2020). This could suggest a reciprocal relationship wherein emotions are indeed valuable for students' learning, motivation, and likewise, learning and motivation are equally beneficial for emotions relating to academic work.

Nevertheless, adolescent students tend to perceive academic activities as stressful (Bakken, 2018; Eriksen et al., 2017; Pascoe et al., 2020). The ability to identify and reappraise these situations may assist them in coping with the negative emotions that accompany academic stress.

2.2.3.1 Development of emotional regulation in adolescence

Emerging evidence suggests that adolescents are prone to becoming emotionally aroused in social contexts and that their emotions can be more challenging to regulate than for other age groups (Spear, 2011). This may further affect students' beliefs and expectations regarding their schoolwork (Pekrun & Linenbring-Garcia, 2012).

Adolescent development of emotional regulation involves brain maturation and cognitive development (Herd et al., 2020). Existing research suggests that the use of cognitive reappraisal increases from early to middle adolescence (Silk et al., 2003). Moreover, students' capacities to regulate emotions develop substantially (Young et al., 2019) and strengthen the capacity to regulate emotional activations and to manage impulsive reactions (Ahmed et al., 2015; Steinberg, 2005). It is also suggested that enhanced emotional control functions as a resource for successful emotional regulation (Schweizer et al., 2020).

However, research has indicated that cognitive reappraisal is less used during adolescence (Lennarz et al., 2019) and that the young tend to focus disproportionately on negative emotions (Skinner, 2016). Such findings may suggest that, despite the indicated normative maturation, more experience in the use of cognitive reappraisal is needed. Hence, a more positive perception of one's ability to reappraise emotionally activating situations may lead to a growth in AEB.

2.2.3.2 Gender differences concerning emotional regulation

Adolescent females report having experienced more emotional challenges relating to learning in school than males (Moksnes & Lazarewicz, 2019). Furthermore, females appear to experience negative emotions more intensely (Chaplin & Aldao, 2013), which is regarded as one of the main sources of gender difference in emotional distress (Thayer et al., 2003). In alignment with this, it is suggested that females become emotionally activated more easily (Neumann et al., 2010) and that higher levels of neuroticism predispose them to respond negatively to perceived threats (Jaffe et al., 2010). Moreover, females may appraise specific stressors as more severe than males (Tamres et al., 2002) and suggested is that they tend to over-analyze emotions more than males (Nolen-Hoeksema & Aldao, 2011). This may give further reason to expect that females and males will regulate their emotions differently.

In the academic context, females are found to be more engaged and motivated than males (Diseth et al., 2014). Nonetheless, females report experiencing greater perceived academic stress. The close link between emotions and academic motivation (Pekrun & Linnenbrinck-Garcia, 2012) may indicate that emotional regulation is important for students' AEB and that more constructive

cognitive reappraisal of negative emotions relating to schoolwork is of greater importance for female effort, beliefs, and expectations regarding schoolwork compared to males.

2.2.4 Mindfulness

Mindfulness is described as a psychological process that brings quality of attention to moment-by-moment experiences (Kabat-Zinn, 2003). It is a form of mental training that reduces the burden of reactive modes of mind that have the potential to heighten stress (Bishop et al., 2004a).

The concept of mindfulness in education aims to teach students to apply meditation practices in a secular context and outside of any religious association (Baer et al., 2019). Class and home practices are pedagogically founded and promote acceptance of the present moment without judgment or elaboration (Crane et al., 2017) and with the aim of nurturing students' mental well-being (Dunning et al., 2019; Weare, 2019).

In this regard, mindfulness can be defined by the two interactive components of the self-regulation of attention and acceptance (Bishop et al., 2004). Self-regulation of attention refers to metacognitions regarding one's cognitions (Bishop et al., 2004a), in which the focus is on the present experience, allowing for increased recognition of mental events. Acceptance concerns having thoughts, feelings, and sensations about the present moment that are relevant subjects of observation with no intention of changing how one feels but rather constituting an effort of acceptance toward the moment of experience (Bishop et al., 2004). Mindfulness thus involves being open to the reality of the present moment (Roemer et al., 2015) with the potential to change a situation's subjective meaning and to regard thoughts and feelings as transient events of the mind (Bishop et al., 2004b; Hill & Updegraff, 2012). When thoughts and feelings are automatically observed as events of the mind without reaction, a state of self-observation is entered that can create a space between the perception and response that enables more reflective and positive reactions to situations (Donald & Atkins, 2016). This can bring a non-elaborative awareness to the current experience that permits insight into the nature of one's mind in a so-called de-centered and present-moment perspective of experience (Bishop et al., 2004). Mindfulness is thought to provide increased ability to choose how

to react to perceived demands (Tharaldsen & Bru, 2011) and to lend greater support to appraisals of stressful situations, promoting emotion-focused coping (Weinstein et al., 2009) as well as leading to more active efforts to resolve the situation at hand through problem-focused coping (Tharaldsen et al., 2011). Hence, mindfulness is a state-like quality that can be developed, as well as a systematic training of the mind to support active efforts to cope with stress.

Teaching students about mindfulness has been shown to foster a non-judgmental approach to academic work and to reduce stressful rumination and worrying (Weare, 2019), which may lead to adequate emotion-focused coping as it pertains to a more open and accepting attitude toward academic stress that can help elicit more adaptive responses (Tang & Tang, 2015; Tharaldsen & Bru, 2011).

Moreover, mindful practices are shown to improve adolescent students' capacity for paying attention and concentrating on schoolwork (Biegel et al., 2009; Broderick & Jennings, 2012). A recent meta-analysis substantiated this and found a small positive effect for students' attention and cognitive flexibility around schoolwork (Klingbeil et al., 2017). Further empirical findings indicate that mindfulness has the potential to enhance individual capacity and to allow individuals to more openly experience and accept the feelings and thoughts associated with stressful academic experiences (McKeering & Hwang, 2019; Shapiro & Carlson, 2009).

Mindfulness may further reduce emotional reactivity to situations perceived as threatening (Goldin & Gross, 2010; Kaunhoven & Dorjee, 2021) and support regulation of emotions through cognitive reappraisal by fostering a more realistic and possibly more optimistic perspective on the situation at hand. Mindfulness may thereby increase the individual's ability to refrain from automatic reactions to stimuli, and function as a resource to support coping (Kaunhoven & Dorjee, 2021) either directly or by supporting cognitive reappraisal of emotions by shifting the way one interprets situations (Garland et al., 2009). This aligns with research suggesting that mindfulness lowers students' perceptions of stress by altering emotions and increasing the timely processing, and thus regulation of, emotional signals related to school tasks (Crane & Kuyken, 2013; Tharaldsen, 2019). As such, mindfulness may have the potential to facilitate adaptive coping concerning schoolwork.

2.2.5 Growth mindset

Another SEC that concerns students' cognition regarding academic work is growth mindset. It refers to the implicit theories of motivational beliefs about how intelligence may be developed through effort and that intelligence is a malleable feature (Dweck & Sorich, 1999). Academic self-efficacy is a similar concept that concerns students' beliefs about their capabilities to overcome obstructions and achieve academic goals (Honicke & Broadbent, 2016; Pajares, 2002; Schunk & Pajares, 2002).

However, the concept of growth mindset conveys the nature of intelligence, making students aware that their intellectual abilities are not fixed at birth but can grow through effort and by trying new strategies as well as seeking help when needed (Dweck & Yeager, 2019). Growth mindset is an important feature of learning that emphasizes focusing on the process rather than the results (Dweck, 2007; Yeager & Dweck, 2012). In contrast to this, students with a more fixed mindset may feel challenged, believing that needing to invest effort in schoolwork indicates that one is not naturally talented and is therefore unlikely to succeed (Dweck, 2007). Growth mindset therefore concerns confidence and beliefs in one's ability to succeed in academic contexts (Claro et al., 2016). Moreover, research suggests that having a growth mindset supports a more adaptive way to cope with challenges (Dweck & Leggett, 1988; Yeager, 2017; Yeager et al., 2017) and that mindset is a feature that can be changed by exposure (Aronson et al., 2002; Blackwell et al., 2007; Yeager et al., 2019). Empirical studies also indicate that mindset shapes meaning-making and determines responses to challenges and setbacks (Dweck & Yeager, 2019; Rege et al., 2020). Students with a growth mindset adjust more adaptively to school transitions and handle academic challenges better than those with a fixed mindset (e.g., Lee et al., 2019). When linked to the notion that coping actions vary according to individual beliefs (Lazarus, 1993), this may involve a growth mindset that influences students' appraisals regarding how to cope with various school-related tasks and performances (Montagna et al., 2021). Accordingly, a person's mindset is most likely to involve expectations and beliefs that function as a resource in the process of appraisal and coping with academic stress. A recent study measured students' levels of stress during the transition from secondary to high school and found that students with a more fixed mindset exhibited elevated cortisol levels compared to students who held growth

mindsets (Lee et al., 2019). Although the study refers to somewhat older adolescent students, the transition from primary to lower secondary school is most likely to have a similar stressful impact on the students. Having a mindset that focuses on the process of learning during this period may therefore be related to enhanced beliefs about coping with new and more advanced learning material. In alignment with this, research suggests that having a growth mindset supports students' ability to cope and reduces stress relating to challenges about learning (Dweck & Legett, 1998; Dweck & Yeager, 2019; Montagna et al., 2021).

Challenge-seeking is a key marker within the theory of growth mindset and concerns the ability to engender optimistic beliefs in the process of learning to be manifested in both mindset and behavior (Dweck & Yeager, 2019). This builds on the assumption that students with a growth mindset regard their ability as something that can be improved through challenging learning goals in which effort is a tool and difficulties or setbacks are treated as information adding to the learning process (Dweck & Yeager, 2019). Persistence in learning may therefore be linked to one's beliefs in one's ability to cope with the learning process and enhance the likelihood of adaptive coping strategies when faced with academic challenges (Molden & Dweck, 2006; Schroder et al., 2017). Hence, fostering a student's mindset may potentially serve as a resource in the coping process relating to academic challenges (Moksnes & Reidunsdatter, 2019; Murberg & Bru, 2004; Yeager, 2017).

2.2.6 Problem-solving, planning and structuring of schoolwork

Problem-solving may be characterized as the systematic process of identifying and acting to find solutions to problems (Carver & Scheier, 2017; Wang & Chiew, 2010). In school, problem-solving may be linked to the process of self-regulated learning (SRL) (Ifenthaler, 2012; Panadero et al., 2017; Puustinen & Pulkkinen, 2001). Problem-solving relate to SRL by students' ability to plan and monitor the steps and, importantly, to evaluate these actions' efficiency (Schunk & Zimmerman, 2012). These skills are known to foster motivationally and behaviorally active participants in learning processes (Pintrich, 2000), and may counteract the potential challenges associated with academic stress.

Problem-solving is believed to generate options for more accurate monitoring and to inform subsequent choices of regulation to modify the problem at hand (Baars et al., 2018). Problem-solving is thus related to increased control and predictability in learning situations (Compas et al., 2017; Shankland et al., 2009). Based on these assumptions, problem-solving is likely to support academic work and provide a useful resource for students' active efforts to cope with stress (Lazarus, 1993; Folkman, 2008).

The ability to solve problems relating to academic work is supported by previous research on positive academic beliefs and reduction of stress (McClelland et al., 2015; Skinner, 2016; Wong & Power, 2019). Empirical results also indicate that the ability to solve problems involves appraising the situation as doable, led by a problem-focused coping strategy that minimizes the impact of stress among adolescents (Spence et al., 2003). In alignment with this, studies suggest that fostering students' problem-solving skills is beneficial for several reasons, such as enhanced academic competence and the reduction of internalized problems (Compas et al., 2001; Eschenbeck et al., 2018; Synder & Snyder, 2008; Spence et al., 2003).

Planning schoolwork and structuring of homework refer to the ability to self-manage one's time and behavior to optimize learning possibilities (Domitrovich et al. 2017; Weissberg et al. 2015). In alignment with the SEC problem-solving, students' perceived ability to plan schoolwork and structure their homework are characterized by active efforts to manage academic work. Research further suggests that these activities may act as sub-divisions of problem-solving (Skinner & Zimmer-Gembeck, 2007; Ifenthaler et al., 2012; Puusti & Puulkinnen, 2001). Planning and structuring schoolwork may be regarded as active and problem-focused resources in the coping process (Aldwin et al., 2011; Ifenthaler, 2012)

Planning involves the cognitive process that creates actions to handle a problem (Carver et al., 1989). In school, students encounter various challenges, and their ability to make plans is known to create a perception of control associated with reduced emotional distress (Doron et al., 2009; Von Soest et al., 2012; Östberg et al., 2015). Research has also proposed a link between students' ability to plan and their AEB (Dinsmore et al., 2008; Diseth et al., 2014), reflecting that the ability to plan schoolwork establishes perceptions of control that support coping

and fuel expectations, effort, and persistence in academic work (e.g., Zimmer-Gembeck & Skinner, 2016).

Students' homework, by contrast, is considered less structured than in-class studying and may vary more among students, depending on how effectively the home environment facilitates homework (Hong et al., 2009). Homework places greater demands on students' self-management skills (Cleary, 2006; Dent & Koenka, 2016), and added to this is that adolescent students tend to receive increasingly larger amounts of homework than younger students despite being less motivated (Núñez et al., 2015). However, students who perceive themselves as able to structure their homework tend to cope more adequately and have more positive efficacy beliefs about schoolwork (Putwain et al., 2018). The use of appropriate strategies concerning homework may thus affect students' efficacy beliefs by demonstrating persistence when encountering challenging learning material (Bandura, 2006; Valle et al., 2016; Zimmerman et al., 1996).

2.2.6.1 Gender differences concerning planning and structuring of schoolwork

Evidence supports the existence of gender differences relating to the planning and structuring of schoolwork. Adolescent females are more persistent than males when faced with challenging academic work (Martin & Steinbeck, 2017). Females also tend to value school more highly than males and are more academically motivated (Diseth et al., 2014; Yeager & Dweck, 2019). At the same time, females experience greater stress in relation to schoolwork (Bakken, 2018; Bakken et al., 2018; Pascoe et al., 2020; Sletten et al., 2017) and invest greater effort in academic work, which may suggest that they experience more emotional distress in relation to academic work (Diseth et al., 2014; Kim, 2021). In this regard, females experience up to four times more stress than males do (Gelhaar et al., 2007; Seiffge-Krenke & Klessinger, 2000) and thus may have a greater need to plan and structure schoolwork to maintain their efficacy beliefs in relation to school and to reduce emotional distress.

2.3 Classroom relations

Classroom relations have been identified as important for students' engagement and learning in school (Patrick et al., 2011; Wentzel et al., 2016). Peer and teacher relations typically change during the transition to lower secondary school and may pose a potential risk for decrements in academic motivation (Eccles & Roeser, 2009, 2011; Kiuru et al., 2020). According to the stage–environment fit theory, a poor fit between individual and contextual components may hinder adolescent adaptation (Eccles, 2004; Eccles et al., 1997). Supportive classroom relationships have been shown to protect against these possible threats (Pianta et al., 2012; Ruzek et al., 2016) A link has also been proposed between functional teacher and peer relationships and students' beliefs about competence and effort in managing academic work (Pajares, 2009; Zimmerman et al., 1996). Supportive classroom relations may affect student's beliefs, effort, and expectations regarding schoolwork (Urdan & Kaplan, 2020; Urdan & Schoenfelder, 2006).

Students' SECs may have the potential to foster positive classroom interactions among peers and teachers (Domitrovich et al., 2017; Wu et al., 2018). More specifically, good relationship skills may facilitate adequate communication and support the establishment of social relations (Zhang et al., 2020). Likewise, emotional regulation through cognitive reappraisal may engender more optimistic emotions concerning learning processes (Pekrun, 2017). A positive development of these SECs during the first year of lower secondary school may therefore function as a resource for functional classroom relations as well as for positive development in students' AEB.

2.3.1 Perceived emotional support from teachers

Perceived emotional support from the teacher concerns students who trust and value their relationship with their teacher as warm and supportive (Özdemir, 2020). According to goal-achievement theory, teachers' emotional support provides students with a sense of ownership in relation to their learning activities (Ames, 1992; Meece et al., 2006) and stimulates their efficacy beliefs through supportive and caring relation (Urdan & Schoenfelder, 2006). This is also associated with optimism regarding one's own potential to complete more challenging academic tasks (Dweck & Yeager, 2019; Yeager, 2017). However,

students in lower secondary school tend to perceive teachers' emotional support as lower than before (Bru et al., 2010; Hughes & Cao, 2018; Madjar et al., 2018) and indicate a mismatch between students' needs and the emotional support provided by teachers during this period (Eccles, 2004). A more positive development of relationship skills may have the potential to engender beliefs about social support for emotional as well as more academic reasons that support establishing such quality student-teacher interactions (Ruzek et al., 2016; Thoits, 2011). Moreover, students' perceived ability to cognitively reappraise emotionally activating situations more constructively—a satisfactory regulation of emotions— may also engender a more positive perception of the teacher as emotionally responsive and supportive in learning situations (Pitzer & Skinner, 2017) and facilitate quality interactions with teachers about learning (Pekrun et al., 2007).

2.3.2 Collaborative peer relations

Collaborative peer relations concern students' perceived competence to help and share academic knowledge with their peers in the classroom (Fernandez-Rio et al., 2017). Research suggests that students who experience functional collaborative peer relations also have more optimistic thoughts about schoolwork (Wentzel et al., 2016, 2017). Moreover, collaborative peer relations are shown to support students' coping and to nurture efforts to accomplish challenging academic tasks (Wentzel, 2017). Nevertheless, the educational structures in lower secondary school may be more demanding and provide fewer opportunities to experience positive peer collaborations about learning (Engels et al., 2017). Students' perceived relationship skills may thus play a key role in establishing positive collaborative encounters with their peers in learning activities (Van Ryzin & Roseth, 2018; Zhang et al., 2020). Likewise, more constructive cognitive reappraisal of emotionally activating situations may serve as a resource in the establishment of good collaborative peer relations about learning (Camacho-Morles et al., 2019; Kwon et al., 2014).

Overall, the development of relationship skills and emotional regulation during the first year of lower secondary school may promote more effective coping in relationships with teachers and collaborative peers (Taylor et al., 2017; Zander

et al., 2018), while perceptions of involvement in more positive classroom interactions may further facilitate a growth in AEB.

2.4 Social and emotional learning interventions

The potential benefits of having good SECs in adolescence are further reflected in SEL interventions, which involve pedagogy for building SEC and simulating internalization and generalization of the competencies over time (Elias & Moceri, 2012). SEL interventions are preventive in nature and effective when provided as universal and school-based (Weissberg et al., 2015). Empirical findings thus suggest that SEL interventions may be incorporated into educational practices and adopted and implemented by practitioners in schools (Wigelsworth et al., 2016) as well as delivered by teachers in the classroom (Durlak et al, 2011). Hence, several promising findings suggest that school-based universal SEL interventions may be effective in stimulating students' SECs.

Furthermore, it is suggested that when students become competent in core SECs, they are better equipped to manage their emotions and to handle their relationships more effectively as well as enjoying enhanced academic engagement (Oberle & Schonert-Reichl, 2017). Effective school-based universal SEL interventions have been found to improve the learning environment, engage students in learning, strengthen student-teacher relations, and increase the potential for all students to cope effectively with developmental tasks (Reicher & Matischek-Jauk, 2017). Results of students' own experiences of participating in a SEL intervention substantiate these findings and suggest that they were more successful in addressing negative emotions and coping with challenging problems (Mahmud, 2020).

2.4.1 Piloting ROBUST

In *study III* a preliminary version of The SEL intervention named ROBUST was used to explore how students experienced learning about relationship skills, emotional regulation, mindfulness, growth mindset, and problem-solving and if they were perceived as a source of support in coping with academic

stress. Results were also intended to be used for the further development of ROBUST.

ROBUST is a school-based universal educational intervention designed to target all students and delivered by the main teachers in the classroom. It thus differs from selective interventions, which target specific groups of students, and indicated interventions for students in need of intensive and individualized interventions (Greenberg & Abenavoli, 2017).
In alignment with empirical recommendations regarding how to structure a school-based SEL intervention for optimal outcomes (sequenced, active, focused, and explicit (SAFE; Durlak et al., 2011), ROBUST was delivered with sequenced lessons throughout the school year. To capture engagement and interest among participating students, each lesson included activities, assignments, and group work. The intervention curricula also allocated time for students to practice between lessons, thus providing an opportunity to generalize the SECs. A total of 20 lessons, each with explicit learning goals, were related to the five thematic modules of relationship skills, emotional regulation, mindfulness, growth mindset, and problem-solving and were delivered weekly for one 60-minute session to whole classes of students during the school year of 2018–19.

Table 1 Overview of the modules in the ROBUST pilot

Modules in ROBUST	Hours	Objective
Relationship skills	Four	Learning about relationship skills in social relations, communication, and social support
Emotional regulation	Four	Identification of emotions and how to cognitively reappraise emotional activating situations
Mindfulness	Four	Learning why acceptance and being in the present moment have the potential to reduce stress
Growth mindset	Four	Learning how to develop and maintain motivation of learning, and about learning as a process
Problem-solving	Four	Learning how to identify challenges and solve problems using problem-focused coping strategies

2.4.1.1. ROBUST teacher training

The teachers who delivered ROBUST underwent a five-day training. The training was developed and delivered by the ROBUST pilot project group,

which consisted of nine representatives from the University of Stavanger. The teachers participated actively in sharing their experiences and providing feedback about the lectures' content throughout the delivery phase. Owing to the desire for consistent teacher involvement, two of the course days were completed prior to the intervention, whereas the remaining three days were completed before each of the three subsequent modules with lectures. The course also provided teachers with insight into the theoretical composition of ROBUST and invited them to participate in discussions about the potential flexibility with which the intervention components could be adapted for practice. Assistance during intervention delivery was provided to the teachers by the school administrators and supported by a teacher champion located at each school.

2.5 Research questions

Study I investigated the associations between relationship skills, emotional regulation, and structuring and planning schoolwork with AEB and emotional distress at the beginning of lower secondary school. *Study II* probed this further by examining how individual changes in relationship skills and emotional regulation relate to changes in AEB and whether these parallel changes are mediated through changes in classroom relations during the first year of eighth grade[2]. *Study III* supplemented *studies I* and *II* and explored students' experiences of participation in the universal school-based social and emotional learning intervention ROBUST and whether these competencies supported their coping with academic stress. The overarching research questions and the research questions for each study were as follows:

How do students perceive their social and emotional competencies, and how are these competencies related to academic efficacy beliefs, and emotional distress, as well as how they are experienced and whether they help coping with academic stress during the first year of lower secondary school?

[2] Eighth grade in Norway is the year during which students typically turn 13 and progress from primary to secondary level.

Study I

RQ1:1 To what extent are relationship skills, emotional regulation, and structuring of schoolwork associated with AEB?

RQ1:2 How are relationship skills, emotional regulation, structuring of schoolwork, and AEB associated with emotional distress?

RQ1:3 To what extent do these associations differ between female and male students?

Study II

RQ2:1 How do relationship skills, emotional regulation, emotional support from teachers, collaborative peer relations, and AEB change during the first year of lower secondary school?

RQ2:2 How are intra-individual changes in perceived relationship skills and emotional regulation related to intra-individual changes in AEB?

RQ2:3 To what degree are these associations mediated by intra-individual changes in collaborative peer relations and emotional support from teachers at school?

Study III

RQ3:1 How did the students experience the social and emotional competencies presented in ROBUST?

RQ3:2 If competencies were perceived as supportive strategies for coping with academic stress, how? If not, why not?

3 Methods

This chapter first presents the philosophical positioning of this thesis as well as its overall design. Thereafter, the contexts for the quantitative *studies I* and *II*, and the qualitative *study III* are described. More detailed information pertaining to the quantitative studies as well as the qualitative study is provided thereafter, and at the end of this chapter, the considerations of validity for all three studies are provided.

3.1 Philosophical positioning

The two quantitative studies (*study I and II*) and the qualitative study (*study III*) of this thesis each represent different methodological traditions. To include diverging methodological stances within a broader ontological understanding, a holistic philosophical view of critical realism was chosen.

The reason is that critical realism alternates the philosophical perspective of positivism, related to the quantified data in this thesis, and constructivism (Fletcher, 2017), related to the qualitative data in this thesis. Within the positivistic tradition, the aim is to observe and measure a given phenomenon. Social constructivism, by contrast, concerns how reality is socially constructed and how humans assemble knowledge based on their experiences (Alvesson & Skoldberg, 2009). Thus, positivism regards reality as objective and measurable, whereas constructivism considers reality to be a product of human activity (Bergin et al., 2008). However, critical realism challenges both these stances and goes beyond the epistemological levels of knowledge by proposing an intransitive real world that exists independent of the human mind with which the main purpose is to explore the possible mechanisms that constitute the phenomena under study (Schiller, 2016).

Critical realism builds upon an ontology with three stratified domains of knowledge: the real, the actual, and the empirical. The *real* domain is intransitive and independent of human thought, awareness, and experiences. It concerns the structures and generative mechanisms that are produced by power or tendencies that may create change unbeknownst to the human mind (Schiller, 2016). The *actual* domain produces mechanisms that may or may not be

experienced by human beings (Schiller, 2016). It thus concerns all events that occur regardless of human experience (Blom & Morén, 2011). The *empirical* domain comprises human observations, perceptions, and experiences of actual transitive events because knowledge is a product of the human mind that changes over time as new experiences are researched (Taylor, 2018). Empirical research is regarded as an attempt to clarify why intransitive events are likely to occur or whether an explanation is likely to be valid (Bhaskar et al., 1998). Therefore, in the context of critical realism, ontology refers to what exists, whereas epistemology considers how one may obtain empirical knowledge about the phenomena in question (Danemark et al., 2002). Hence, one may better understand the nature and strength of generative mechanisms through quantitative means and by obtaining rich explanations of mechanisms in the same phenomenon using qualitative methods (Bhaskar, 1998). Critical realism acknowledges that scientific research does not constitute perfect truth and will always be fallible owing to imperfect observable methods and where existing theories are considered a starting point for investigations.

This thesis aimed to study students' perceived SECs, academic stress, and emotional distress in lower secondary school based on existing theories and empirical knowledge. The use of quantitative methods allowed for the quantification of data—in this case, a large volume of students' perceptions in the empirical domain, and for investigating the associations among variables. The constructs used to study the phenomenon were latent variables in structural equation modeling (SEM). However, the estimation of latent variables is not considered an exact representation of the intransitive reality but rather is used with the aim of replicating the error-free processes that are assumed to be generated from the real domain (Pratschke, 2003). The structural models used in *studies I* and *II* are therefore considered to be representations of students' perceptions in the empirical domain that, when combined with theory, may provide explanations relating to the mechanisms generated from the real domain (Borsboom et al., 2004).

To further explore students' perceived usefulness of learning about the SECs and as a means of coping with academic stress, a qualitative approach was selected. In line with the stratified ontology of critical realism, it was recognized that informants were knowledgeable about their perceived experiences, which then provided empirical access to the phenomena, and

through theory, intentions were made to explain or to create a better understanding of the intransitive mechanisms generated from the real domain (Fletcher, 2017). Nonetheless, these intentions are not expected to reveal the true and real generative mechanisms of action but still provide access to knowledge about the actual and empirical representations of such actions (Smith & Elger, 2014).

As inferences were made about the results from quantitative *studies I* and *II* and the qualitative *study III*, the overall design for this thesis is to be considered a multimethod design (Creswell & Poth, 2016). This is because multimethod designs allow results from quantitative and qualitative methods together to inform and expand the explanations of the studied phenomena (Hesse-Biber & Johnson, 2015). This does not imply that the quantified results are analytically mixed with the qualitative results or vice versa; rather, it simply reflects that the inferences drawn about the empirical results for each of the three studies are considered in combination in a bid to better understand and contribute with more profound explanations relating to the generative mechanisms of the concept under study.

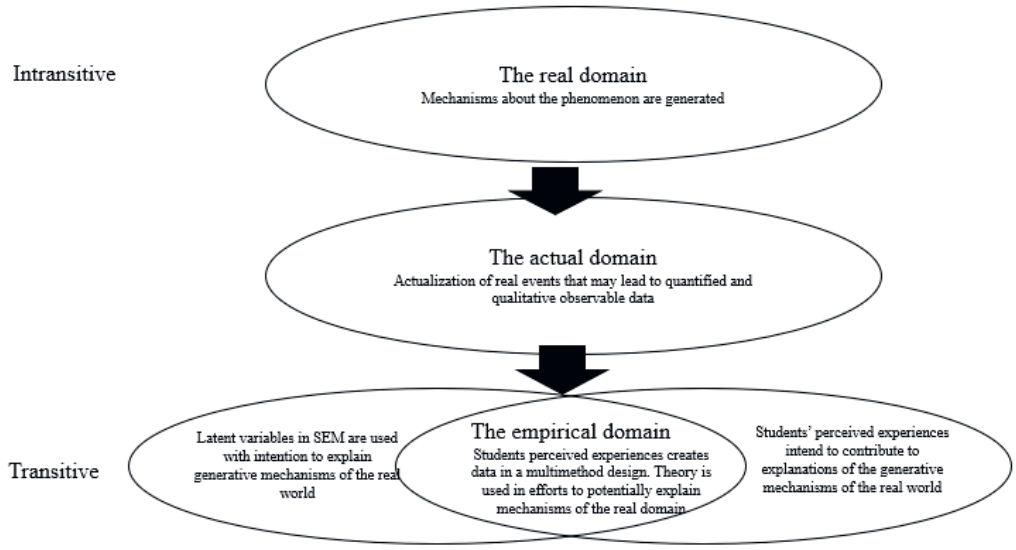

Figure 2 An overview of the stratified ontology of critical realism in regard to studies of this thesis

3.2 The context of the studies

One purpose of this thesis was to obtain new knowledge by trying out the ROBUST pilot. The school administrators where the project took place, however, desired that a parallel intervention would take place and thus arranged for half of the sample to receive a philosophy and rhetoric intervention named Dialogos (Helskog, 2019; Weiss & Helskog, 2020).

ROBUST was a psychologically oriented intervention while the alternative intervention, Dialogos, had a philosophical perspective. Despite differences, the interventions also shared several similarities. The concepts of relationship skills, emotional regulation, and—to some extent—aspects of mindfulness were present in both interventions. For example, Dialogos (Helskog, 2019) instructed students about communication as a tool for interaction with others (Weiss & Helskog, 2020). Similarly, ROBUST taught students about how communication may facilitate supportive interactions. Moreover, Dialogos informed students about emotional knowledge and awareness, whereas ROBUST lectured about emotional awareness and emotional regulation. To some extent, both interventions provided students with knowledge about the importance of being present.

A lot was learned about ROBUST during this period (e.g., results of *study III*), and an adjusted and further developed version is currently undergoing testing in a random controlled trial. However, the similarities between the interventions included no expectations that we would find either effects or differences between the two. As the initial intention was to trial and develop ROBUST for future and more conventional trials, it was decided that this thesis would include data from the entire sample to quantitatively examine students' changes in the SECs as well as associations between these and classroom relations and AEB throughout the first year of lower secondary school (*study II*). Furthermore, a qualitative study was included to explore students' perceived experiences of their participation in ROBUST (*study III*).

3.3 Quantitative studies

3.3.1 Design, sample, and procedure

The decision to use a cross-sectional correlational research design in *study I* and latent change scores across two time points in *study II* was taken to facilitate a closer examination of the associations between study variables. Data were collected via survey from the same sample, with individual coding at two time points. Thus, the study was defined as a longitudinal panel study in which the same unit of analysis was followed throughout the first year of lower secondary school.

Overall, 1322 eighth-grade students in one municipality in the east of Norway were invited to participate in the ROBUST pilot project in the spring of 2018. In light of the students' ages at the time, the parents of 1234 (N = 93.3%) gave consent to participate on their behalf.

The students completed an identical digital assessment during one school hour. The overall sample answered the surveys at either the first, the second, or both time points and consisted of 1205 (97%) eighth-grade students within 54 classes of 11 lower secondary schools. A total of 1142 (92.5%) students completed the questionnaire at the first time point and 1041 (84%) students completed it at the second time point. For both time points, 1031 (83.5%) students completed the survey. A more detailed description of the sample sizes at each time point is provided in Section 3.3.3.1 on missing data and sample attrition.

The first assessment took place in September 2018, three weeks after the students started eighth grade in a new school. The students were aged between 12 and 13 years at the time (females 51%). The second assessment was conducted in March 2019, toward the end of the same school year, when the students were aged 13–14 years (females 51%).

3.3.2 Measures

Students' perceived emotional distress was used as an outcome variable in *study I,* and AEB was the intermediate variable in *study I* and the outcome

variable in *study II*. Five measures were used to measure students' perceived SECs: planning schoolwork (*study I*) and structuring of homework (*study I*), relationship skills, and emotional regulation through cognitive reappraisal (*studies I* and *II*). AEB was also considered an SEC. Classroom relations—emotional support from teachers and collaborative peer relationships—were used as intermediate variables in *study II*. Table 2 presents an overview of all measures with item wording, scaling categories, and internal consistency. A more substantial presentation of measures is also found in the respective articles of *studies I and II*. Section 3.3.2.1 presents the measures used as covariates in each of the studies. Furthermore, Appendix 1 presents an overview of the identical survey used at both time points in Norwegian. However, some of the study measures were originally worded in English, and the recommended translation procedure for cross-cultural adaptation was followed (Beaton et al., 2000). First, lingual experts translated the scales from English to Norwegian, and then a process of back translation into English was accomplished. Subsequently, an expert group considered the adaptation of the items for the Norwegian context. The expert group comprised researchers who were highly familiar with the scales and discussed and agreed upon issues relating to the translated instrument's integrity as well as semantic and conceptual equivalence.

Table 2 Overview of measures used in *studies I* and *II*. References of scale origin, items, response categories, and indicators of reliability are given in Cronbach's alpha and McDonald's Omega.

Name, origin reference, and response categories	Item wording	α	ω	Study
<u>*Emotional Distress*</u> Hopkins Symptom Checklist-10 (Derogatis et al., 1974; Strand et al., 2003). Likert scale: 1, not troubled; 4, very troubled		0.90	0.90	I
	Sudden fear for no reason. Feeling scared or anxious. Fatigue or dizziness.			

	Feeling tense or anxious. Easy to blame yourself. Sleep problems. Depressed, heavy-hearted (sad). Feeling of being useless, little worthwhile. Feeling everything is an effort. Sensation of hopelessness with regard to the future.			
Planning of Schoolwork COPE, subscale planning (Carver, Scheier, & Weintraub, 1989) The Likert scale ranged from 1 to 6, with 1 being I strongly disagree and 6 being I strongly agree. Measures marked with an asterisk (*) use the Likert scale.		0.91	0.91	I
	I make a plan of action. I try to come up with a strategy about what to do. I think about how I might best handle the problem. I think hard about what steps to take. I have done what must be done step by step.			

Structuring Homework Derived from the Self-Regulation Strategy Inventory—Self-Report, factor loading A-subscale (Cleary, 2006). Likert scale 1–6, 1-Never, 2-Almost never, 3-Rarely, 4-Occasionally, 5-Often, 6-Very often		0.75	0.75	I
	I make sure no one disturbs me when I study. I make a schedule to help me organize my study time. I finish all of my studying before I play video games or visit my friends. I try to study in a quiet place. I think about how best to study before I begin studying.			
**Academic Efficacy Beliefs* (Gaumer Erickson et al. 2016). Self-Efficacy Questionnaire		0.92/0.89	0.83/0.93	I and II
	I can learn what they teach at school this year. I can figure out anything if I try hard enough. If I practice every day, I can become good at almost anything. When I have decided to accomplish something that is important to me, I keep trying to			

	complete it, even if it is more difficult than I thought. I am certain that I will achieve the goals that I have set for myself. When I'm struggling to accomplish something difficult, I focus on the progress I make instead of feeling discouraged. I believe hard work pays off. My abilities grow based on the effort I make. I believe that the brain may be developed like a muscle. I think that regardless of who you are, you may make considerable changes to your abilities. I can change my capabilities significantly.			
*<u>*Relationship Skills*</u> Developed by the ROBUST project group	I get to know others easily. I get in touch with others quickly. I know how to take contact with others. I capture the interests of others in a positive way. I easily find something to talk to others about.	0.90/0.91	0.93/0.93	I and II

*<u>*Emotional Regulation*</u> The Emotional Regulation Questionnaire for children and adolescents (ERQ-CA). (Subscale – cognitive reappraisal) (Gullone & Taffe, 2012)		0.88/0.88	0.94/0.94	I and II
	When I want to feel happier, I think about something else. When I want to feel less bad [e.g., sad, angry, or worried], I think about something else. When I am worried about something, I think about it in a way that helps me feel better. When I want to feel better in relation to something, I change the way I think about it. I control my feelings about things by changing the way I think.			
*<u>*Emotional support from teachers*</u> (Bru et al., 2002)		0.92	0.95	II
	I can trust my teachers. My teachers will always help me if I have problems. I feel my teachers believe in me. I feel my teachers care about me. I feel that teachers appreciate me.			
*<u>*Collaborative peer relations*</u>		0.89	0.93	II

Developed by the ROBUST project group		
	I collaborate with fellow students to understand the lesson.	
	I help other students to understand the lesson.	
	I encourage my fellow students to make an effort when struggling with schoolwork.	
	My fellow students help me understand the learning materials.	
	My fellow students encourage me to effort when I struggle with schoolwork.	

3.3.2.1 Covariates

To control for the effects of covariates on the outcome and thus increase the results' accuracy, students' socioeconomic status (SES), parents' academic support, and students' academic performance were included as control variables in the structural model used in *study I*. Existing research has demonstrated that students' emotional distress and AEB are related to inequality in SES among adolescent students (Reiss, 2013). Students with lower SES have been found to report higher incidents of emotional distress (Wadsworth et al., 2016). Moreover, students' optimism, effort, and perseverance with respect to schoolwork vary with socioeconomic status, whereby lower SES is associated with reduced academic optimism (Dweck, 2007; Yeager & Dweck, 2012). Parents' academic support has also been shown to bolster academic motivation (Maddux & Kleiman, 2016) and reduce emotional distress in adolescence (Reiss, 2013). Students' perceived academic performance is also related to AEB based on the notion that optimism, efforts, and beliefs about schoolwork (Pajares et al., 2007) tend to reduce adolescent emotional distress (Moksnes et al., 2016).

Students' SES was measured with one item conceptualizing home affluence and economy based on a Norwegian prosperity standard derived from the Family Affluence Scale II (Boyce, 2006): "*During the past 12 months, how many times did you travel on a holiday with your family*?" using a four-step scoring format that ranged from 0 to 3: *not at all, 0; once, 1; twice, 2; more than twice, 3*.

Parents' academic support contained a composite of three items: "*My parents are interested in my schoolwork*," "*My parents help me with my schoolwork when I ask them*," and "*My parents often praise me for my efforts with schoolwork*." A five-step scoring format was used: *1 strongly disagree, 2 disagree, 3 disagree a little, 4 agree, 5 strongly agree* ($\alpha = 0.81$).

Academic performance in *study I* was measured using a composite score of results from national tests of students' performance in Norwegian reading, math, and English ($\alpha = 0.83$).

Gender and students' grade point average (GPA) were used as control variables in *study II*. Research has shown that GPA is correlated with students' academic self-efficacy (Schunk & Pajares, 2002), and peer and teacher classroom relations (Gallardo et al., 2016; Gebauer et al., 2020; Sointu et al., 2017). Although gender differences in AEB are somewhat inconsistent (Spinath et al., 2014), adolescent males tend to report higher academic self-efficacy (Fuertes et al., 2020; Salavera et al., 2017). Moreover, more females than males have been found to establish supportive peer relations with teachers and peers in class (Brass et al., 2019).

Owing to the parallel interventions across the school year, group belonging was also included as a covariate with the values 1 and 2 for each of the groups.

Students' GPA used in *study II* included a composite score of grades in Norwegian, math, and English from the first semester of eighth grade. The grades ranged from the lowest one to the highest six (α =0.73).

3.3.3 Analytic strategy

The data used in *studies I* and *II* were first explored descriptively (mean, standard deviation, normality of data, and bivariate correlations) by the

Statistical Package for the Social Sciences (SPSS), version 25. The statistical program M*plus* version 8.3 (Muthén & Muthén, 2017) was used for SEM in both studies. SEM is a multivariate statistical method that allows for simultaneous analyses of structural relationships. A factor-analytic approach was combined with multiple regression analysis.

SEM requires large sample sizes, and a consideration of missing samples and attrition for both studies is first provided. Thereafter, follows the analytic choices made in *studies I* and *II*.

3.3.3.1 Missing, sample attrition, and estimators

Missing data theory explains the mechanisms of missingness and its relationship to data. The literature usually differs regarding the three mechanisms of missing (Graham, 2009)—missing at random (MAR), missing completely at random (MCAR), and missing not at random (MNAR). When data are considered MAR, it is assumed that missingness in a variable is related to other observed variables in the data but not to the missing values of the variable itself. This implies that the missingness is systematic but can become random when the values that the missingness depends on are controlled for. The MAR assumption is therefore considered less restrictive compared to the mechanisms of MCAR, where missingness is assumed to be random and completely unrelated to the observed and unobserved data (Enders, 2008). MNAR, on the other hand, contrasts with the other two mechanisms as it deals with non-ignorable missingness. The missing values are related to the variable that contains missingness even after controlling for other variables (Enders & Bandalos, 2001). The latter condition is therefore expected to bias parameter estimates.

S*tudy I* consisted of 1147 cases at time point one (T1). Five cases were removed from the data set (05%), leaving a sample size of n =1142 (92.5%). As these data met the MCAR assumption, $\chi^2(6) = 3.38$, p =.76 (Little, 1988), a listwise deletion by default was used to handle missingness. All levels of missingness were, however, below 1%, ranging from $\leq$ 0.4% for emotional distress to the highest for AEB $\leq$ 0.8% [relationship skills <0.6%, emotional regulation < 0.1%, planning of schoolwork <0.2%, structuring of homework <0.2%]. Although listwise deletions are known to reduce power in analysis, it is also

suggested that low missingness <2% does not impact power or bias variable values (Widaman, 2006).

Regarding *study II*, at time point two (T2), 1094 students completed the questionnaire. Owing to their poor response quality, 53 cases were removed, and the final sample consisted of 1041 cases (84%). Latent constructs were estimated for the observed item, and missing cases ranged between ≤8.3% for teachers' emotional support and ≤10.7% for AEB [relationship skills ≤9%, emotional regulation ≤10%, collaborative peer relations ≤9.6%].

Sample attrition between the two time points was 5% (1147_{T1}-1094_{T2}). In addition, at each time point, a unique part of the sample participated—n= 111_{T1only}, n=63_{T2only}—leaving one part to participate at both time points—n=$1031_{T1\text{-}T2}$ (N=1205) (Figure 3).

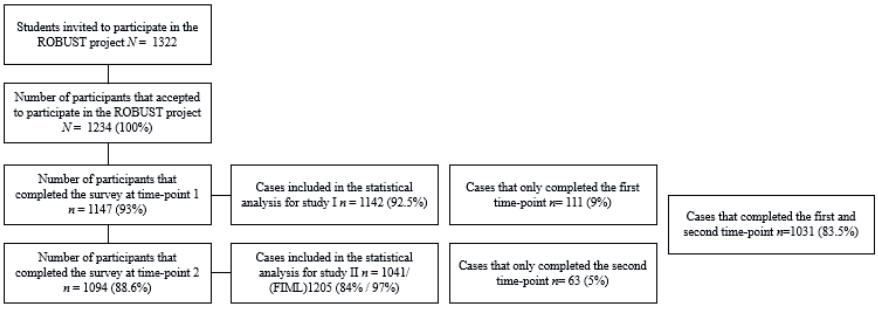

Figure 3 Overview of sample and cases at item level for the two time points of *studies I* and *II*

There was no obvious pattern that explained sample attrition between time points, and it was decided to use an inclusive estimation approach of full imputation maximum likelihood (FIML) estimation, which in regard to *study II* made it necessary to investigate the potential mechanisms of missing.

The use of FIML requires that assumptions of MCAR or MAR be met as it builds on the maximum likelihood estimation with which the likelihood of the observed data is maximized (Gibson & Ninness, 2005). FIML's advantage is that it includes the missing data in the calculation of parameter estimates and

standard errors (*SE*) without the deletion or imputation of missing values, providing greater power and less biased estimation (Kline, 2015).

Investigation of missingness in data relating to *study II* revealed a non-significant correlation between the variable of missingness (1 = cases at both time points, 0 = missing), and all latent change score (LCS) variables in the structural model—relationship skills: $r = 0.03$, emotional regulation: $r = 0.02$, emotional support from teachers: $r = 0.00$, collaborative peer relations: $r = 0$ .01, and AEB: $r = 0$ .03; with all p-values >0.05. The MAR assumptions were met and allowed for the use of FIML and the inclusion of the entire sample in the estimation ($N = 1205$). Hence, an inclusive analysis strategy (Enders, 2010) with auxiliary variables that were highly correlated with the incomplete missing variables (Enders, 2010) (well-being and behavioral engagement r=>0.40) was used in the estimation. Furthermore, and despite a somewhat lower correlation with missingness, socioeconomic status (SES: $r = 0.07$, $p<0.05$) and school absence ($r = \geq 0.23$, $p<0.001$) were included as auxiliary variables to remove the bias from the estimates.

Some of the variables in *studies I* and *II* exceeded the suggested cut-off values for skewness and kurtosis (Brown, 2015: +3- -3) and indicated that the data were non-normally distributed. To account for this in the estimation, a robust maximum likelihood estimator (MLR) was used to provide robust standard errors (Muthén & Muthén, 2017).

Because MLR is not applicable with a bias-corrected bootstrap procedure, the 95% confidence intervals (95% *CI*) for the indirect associations in both studies were estimated using maximum likelihood (ML) estimation. As using an ML estimator typically requires data to be complete, precise, and free of errors, the change of estimator was inspected for inflated standard errors (*SE*). In *study I*, *SEs* for the ML estimator in latent variables ranged between 0.01 and 0.05, which was equal to the *SE*s for the robust ML. *Study II* yielded the same results: the *SEs* ranged between 0.01 and 0.04 for both an ML and robust ML estimator. Hence, the change in estimator did not inflate the *SE*s.

To determine model fit, the overall model fit, the approximate fit and measures of model comparison were examined. The standardized root mean square residual (*SRMR*) was used as an overall fit indicator, and values close to 0.08

were considered a good fit (Hu & Bentler, 1998). The root mean square error of approximation (*RMSEA*) was used for considerations of an approximate fit with values ranging between 0.06 and 0.08 and supported by a 90% confidence interval (*CI*). The Tucker-Lewis index (*TLI*) (Tucker & Lewis, 1973) and comparative fit index (*CFI*) with values close to 0.95 were considered to be an acceptable fit (Shi et al., 2019).

3.3.3.2 Analysis in *study I*

Confirmatory factor analysis (CFA) was used to estimate the relationship between the observed indicators and unobserved latent factors (Lim & Cheung, 2021). Our main objective in choosing CFA was to validate the factor structures, to examine measurement invariance across groups and to assess measurement models as a part of SEM.

CFA was thus used to test the fit of each of the measurement models in the study and to ensure that the observed measures represented indicators measuring its intended latent construct. Some of the measurement model's correlation of errors were allowed to attain acceptable model fit. This was due to conceptual overlap between the errors, indicating that they measured something in addition to what they were intended to measure. However, all error correlations were kept to a minimum and related to a conceptual rationale.

In the SEM modeling, emotional distress was regarded as a dependent latent variable, whereas relationship skills, emotional regulation, and structuring and planning of schoolwork were considered independent latent variables. AEB had the role of an intermediate variable between the other SECs and emotional distress (Figure 4). A multi-group function with unstandardized betas was used to examine the gender differences using the Satorra-Bentler scaled chi-square difference test.

Measurement invariance was tested using multi-group testing for each construct both separately and in combination. The least restrictive configural model was tested against the more restricted model of metric invariance; likewise, this model was tested against the more restrictive model of scalar invariance with equally constrained intercepts and factor loadings across groups. As these estimations were made using MLR, the scaled chi-square

difference test (Satorra & Bentler, 2001) was initially used to inspect significant differences. However, as the sample size (n = 1142) was assumed to affect the chi-square value, the guidelines recommended by Chen (2007) were added. Accordingly, an *RMSEA* value of $\geq$ 0.015 and a *CFI* value of $\leq$ - 0.010 were considered sufficient cut-off points for the levels of models tested. Any increase or decrease exceeding the suggested cut-off values would indicate that the assumptions of measurement invariance at a given level were not met (equivalence in factor loadings or intercepts).

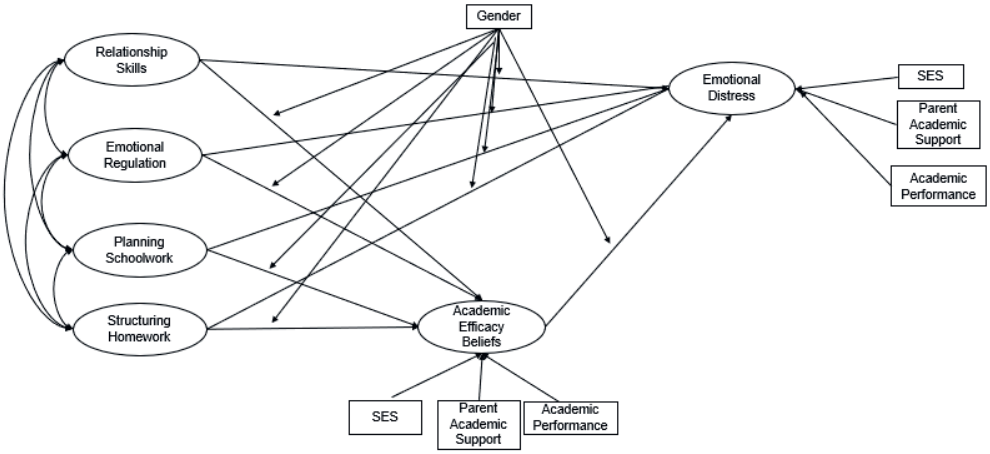

Figure 4 An illustration of the paths in the structural model in *study I*. The moderation of gender for all paths was investigated. SES, parents' academic support, and students' academic performance were used as control variables.

3.3.3.3 Analysis in *study II*

First, measurement models at each time point for the study constructs—relationship skills, emotional regulation, emotional support from teachers, collaborative peer relations, and AEB—were examined separately. Longitudinal measurement models were further used as the starting point for estimation of univariate LCS models. Each univariate LCS represented interindividual differences in true intra-individual change across the two time

points (Geiser, 2012). The estimation is thus a reformulation of the longitudinal measurement model in which the latent second time point$_{T2}$ factors were decomposed into a latent factor for the first time point$_{T1}$ and an additional latent factor, free from errors, that represented the LCS growth or decline from the first to the second time point (Reuter et al., 2010). The equation for LCS may be explained as follows:

$T_2=T_1+(T_2-T_1)$

where the variable (T_2-T_1) represents the LCS.

Furthermore, the constrained univariate LCS model that implied strong factorial time measurement invariance was tested against the unconstrained model by freeing factor loading and intercepts. The lack of any significant change in model fit between the two models confirmed a longitudinal strong factorial invariance. The Cheung and Rensvold (2002) criterion of *CFI* change $\leq$-0.010 was additionally used to consider and confirm longitudinal measurement invariance for all LCS in SEM.

The univariate LCS included estimation of indicator-specific factors for each pair of observed indicators across time. The indicator-specific factors were added to account for the method specificity that tends to occur when using the same measures across time—the method specificity of observed indicators in the model (Geiser, 2012; Geiser et al., 2019). The squared standardized loading of the indicator-specific factors provided information about the amount of variability in the observed variables that were accounted for by indicator specificity (Geiser & Lockhart, 2012), and these ranged between 4 and 18%, suggesting that the measures were relatively homogenous and reflected the same true score at both time points.

Furthermore, the LCS were modeled in SEM to investigate how interindividual differences in true intra-individual changes for relationship skills and emotional regulation related to changes in emotional support from teachers, collaborative peer relations, and AEB. As the LCS were measured on equal time points, the proposed relations among variables were built on theoretical rationales. Emotional support from teachers (part A, Figure 5) and collaborative peer relations (part B, Figure 5) functioned as intermediate variables in two separate models. Two models were used owing to the relatively high shared variance for

these LCS with AEB and to reduce the risk of mitigating a type II error—failing to reject the null hypotheses—when, in reality, this was correct.

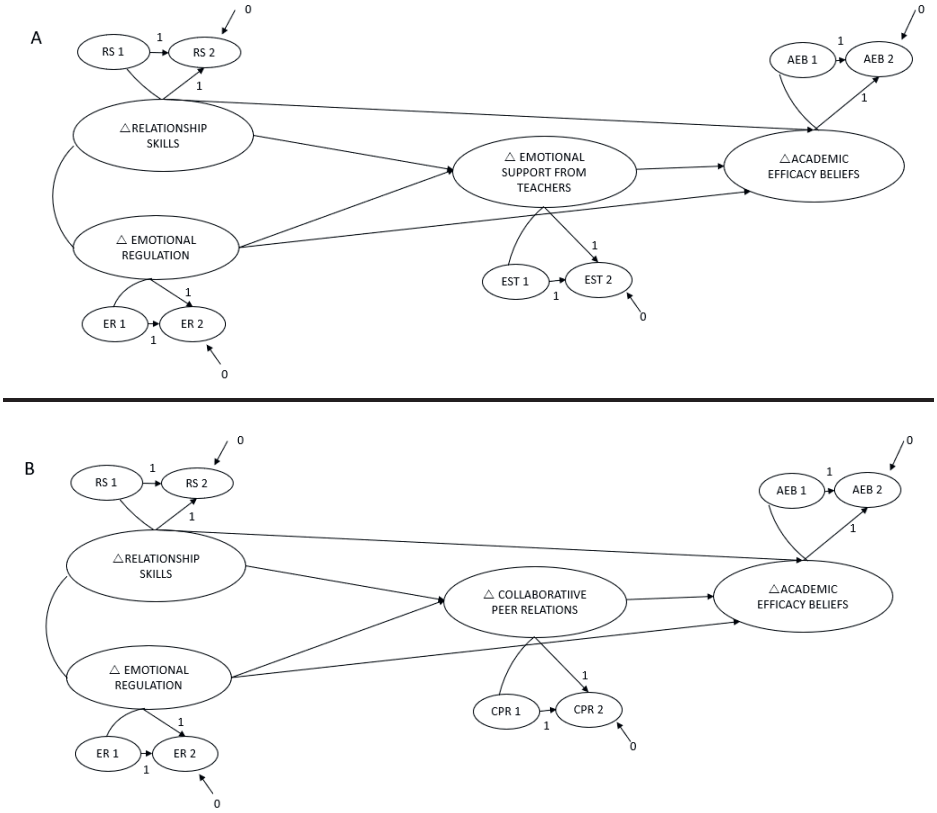

Figure 5 An illustration of the two separate models of LCS estimated in *study II.* Part A depicts the LCS relationship skills (RS), emotional regulation (ER), emotional support from teachers (EST), and AEB. Part B illustrates the structural model with the same parameters and with change in collaborative peer relations (CPR) as an intermediate variable.

3.3.3.4 Clustering of data

The data in *studies I* and *II* mainly concerned analyses at the individual level. However, as data clustering and the potential variation at the classroom level may have inflated analysis at the individual level, intraclass correlations (ICC) and design effects for study variables were examined.

All observed variables were within the recommended levels for ICC (Hox, 2002) (0.01–0.05), thus indicating a small amount of classroom-level dependency of observations. This was the case also for the variables concerning classroom relations, which gave reason to investigate individual changes in emotional support from teachers and collaborative peer relations in *study II*.

Additionally, design effect was controlled and applied based on the "rule of thumb" that, when smaller than 2, the use of single-level analysis on potential multi-level data does not lead to overly misleading results (Muthén & Satorra, 1989). As the design effects for variables in the studies ranged between 1.2 and 1.9 (all < 2), this suggested that it was not necessary to accommodate homogeneity in the clustered data using a multi-level design. Nevertheless, since the students were nested within schools ($N = 11$) and classes ($N = 54$), the parameter estimates were adjusted to account for dependency in the data using type = complex (Asparouhov, 2006).

3.4 The qualitative study

Study III's main objective was to qualitatively explore students' experiences when learning about SECs through ROBUST and whether it supported coping with academic stress.

3.4.1 Design and sample

Overall, the study was designed as an embedded single case (Yin, 2009) as the focus was on three samples, one from each school within the same municipality. In alignment with the choice of design, the aim was to study a phenomenon within its real-life context (Creswell & Poth, 2016; Yin, 2009) and to adopt a more nuanced perspective on the subject (see, e.g., Yin, 2009) and thus obtain a deeper understanding of students' experiences of learning about SECs in the ROBUST pilot intervention.

From the sample that received the ROBUST intervention ($n = 545$), the study comprised three schools on an east, west, and south criterion. This was due to demographic variations within the geographic areas in the municipality and concerned differences in family income and living conditions that diverged within each of the three areas.

The selection criteria were therefore initially purposive and stratified (Krueger & Casey, 2002) and performed by the municipality school administration. One school within each of the three geographic areas was randomly selected by the ROBUST pilot project group.

A sample size ranging between eight and 10 participants in focus groups has been identified as ideal for maintaining the group dynamic and maximizing the overall experience (see, e.g., Krueger & Casey, 2014). To ensure an adequate sample size for the current focus groups and to account for potential drop-out, 12 students within each school were invited to participate.

A total of 10 students—three from the school located in the east, five from the west, and two from the south—did not respond to the invitation or provide any reasons for their decision not to participate.

A total sample of 26 participants agreed to participate in the focus groups: eight students from school one (location, west: four females and four males), eight students from school two (location, south: six females and two males), and 10 students from school three (location, east: five females and five males). The sample had a fair gender balance: 15 of the participants were female and 11 were male. All were aged between 13 and 14 years at the time (n = 26).

3.4.2 Data collection

Focus groups were determined most suitable as they are known to facilitate a deeper understanding of the topic under study (Krueger, 2014; Krueger & Casey, 2002). Moreover, focus groups are believed to support equal communication more naturally, owing to the inclusion of multiple participants with shared experiences (Tong et al., 2007; Wilkinson, 1998).

A semi-structured interview guide with open-ended questions was developed to explore students' overall experiences of participating in ROBUST (Appendix 2). In *study III*, students' experiences with the SECs and whether they were supportive in coping with academic stress was explored. To assure the accuracy of the data obtained, the interview guide was first piloted (Malmqvist et al., 2019). Five eighth-grade students within one school provided feedback on the wording of questions and the length of the interview guide.

This resulted in reformulation as well as removals of questions that were assumed to make the interview guide more age-appropriate.

The main themes for the interview guide concerned students' experiences with ROBUST. As the informants' age group were likely to adhere to higher social conformity owing to the desire for acceptance among their peers (Blakemore & Mills, 2014), extended interviews covering the main topics were sent to the participants a week in advance of the focus groups with the intention of raising individual voices and hence increase trustworthiness of data (Lune & Berg 2016).

Furthermore, and in accordance with Krueger and Casey's (2014) suggestions, focus group among young persons should be limited with respect to time, and efforts should be invested in keeping the informants active. To this end, the focus groups lasted between 60 and 90 minutes, and the open-ended questions were used in a free manner and adapted to the context and progress.

To ensure safe and friendly environments (Krueger, 2002), the focus groups met at the respective schools during school hours (Krueger, 2014; Lune & Berg, 2016). The focus groups were audio-recorded, and afterwards, the data were transcribed verbatim and proofread by the researchers to verify the accuracy of data, notes, and general perceptions during the interviews. Data saturation (Fusch & Ness, 2015) was determined after the third interview, as no new information emerged. To further ensure that the data were rich and informative, information power (Malterud et al., 2016) was considered. This means that the relevance and specificity of the information that the sample held and the quality of the dialogue during the focus groups was deemed sufficient.

A member check consisting of an overview of the initial analysis—was sent to informants after the interviews to control for accuracy of descriptions and interpretations. The member check thus offered a means of securing the data quality as well as an opportunity to extend and/or adjust the data analysis (Miles et al., 2014), hence increasing thrustwortiness.

3.4.3 Analysis

A qualitative conventional content analysis was used to analyse the data (Weber, 1990). Conventional content analysis is characterized as an analytical approach used to describe a phenomenon when prior knowledge is limited (Hsieh & Shannon, 2005). The assumed scarce empirical knowledge about how adolescent students experienced the SECs as presented in ROBUST as well as their perceptions of these as useful means of coping with academic stress rendered the conventional content analytical procedure with its initial inductive approach suitable for generating new knowledge (Mayring, 2004).

After transcription, all data were read several times by two researchers separately to obtain a holistic sense of the data. Second, codes were derived from the key concepts that emerged. These codes were conceptualized from students' general perceptions about the SECs as presented in ROBUST. Thereafter, labels for codes that captured more than one key concept became the initial coding scheme. As the main objective of the focus group centred on relationship skills, emotional regulation, mindfulness, growth mindset, and problem-solving, they were identified as codes.

In the next step, these codes were sorted into categories based on their relationships and grouped into clusters of meaning. In accordance with the study's guiding research question, the categories concerned students' experiences of participating in ROBUST and perceptions of competencies that supported them in coping with academic stress.

Finally, as visualized below (Figure 6), the codes were organized into dimensions and sub-dimensions in a hierarchical structure. Two dimensions of supportive competencies and challenging competencies were recognized. The first dimension comprised the three sub-dimensions of mindful acceptance, making plans, and strengthened motivation, while the second dimension identified the potential benefits and difficulties of SECs.

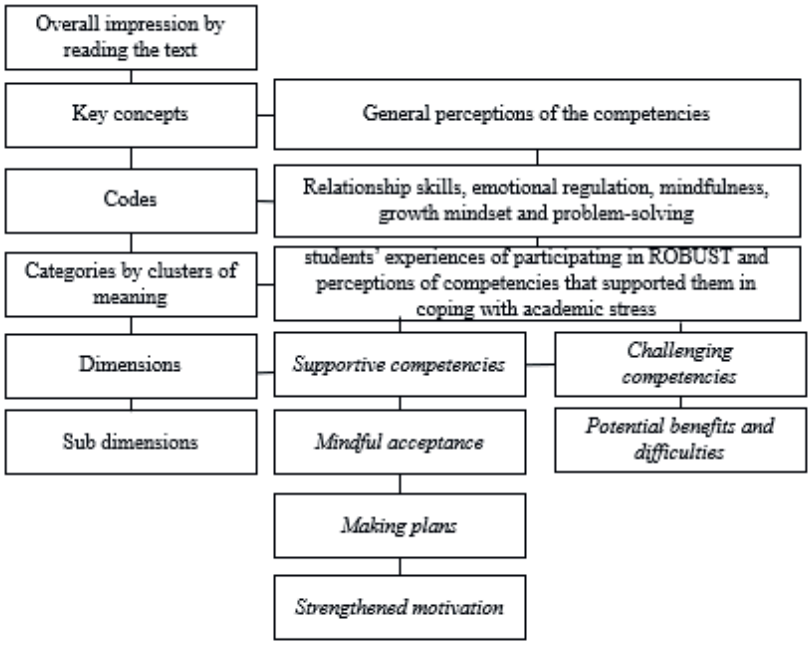

Figure 6 A display of the analytic process of conventional content analysis.

3.5 Validity

First, inferences about validity in the quantitative studies will be discussed in relation to the four related components of statistical conclusion validity, internal validity, construct validity, and external validity (Shadish et al., 2002). Thereafter, the qualitative study will be reflected upon to assure valid transparency about the research process. In efforts to do so, descriptive, interpretive, and theoretical validity as well as generalizability (Maxwell, 1992), are combined with the four evaluative terms of trustworthiness: credibility, confirmability, dependability, and transferability (Lincoln & Guba, 1985; Miles et al., 2014). Moreover, the stratified ontology of critical realism does allow for the inclusion of inferences made from different methodological perspectives to explore the ontological mechanisms, and questions about

validity may be differentiated without being contradicted among the quantitative and qualitative studies of this thesis.

3.5.1 Validity in quantitative studies

Statistical conclusion validity is the degree to which conclusions about the relationships between variables are appropriate or reasonable (García-Pérez, 2012) and concerns the degree to which the values are trivial or worth interpreting (Shadish et al., 2002).

The use of latent constructs in SEM in *study I* accounted for errors and is assumed to have strengthened the inferences drawn about relations among variables. Emotional distress was treated as an outcome variable, whereas AEB was an intermediate variable. Gender differences for direct paths in the model were also examined. The independent variables of relationship skills, emotional regulation through cognitive reappraisal, planning of schoolwork, and structuring of homework were all significantly associated with AEB and may suggest that the relations were valid and merited interpretation. However, a lower beta value for schoolwork planning with emotional distress as well as the positive association (β = 0.08, p<0.05) may reflect a weaker statistical conclusion validity and suggest that interpretations regarding inferences should be made with care.

In *study II*, the inferences drawn about the relationships between variables were considered substantial owing to efforts to establish true latent change without errors. Change in AEB were treated as dependent variable, which were significantly related to changes in relationship skills and emotional regulation through cognitive reappraisal. The intermediate variables—change in emotional support from teachers and collaborative peer relations—were estimated in two separate models owing to the relatively high correlation and to reduce the risk of a type II error. Each of the two models exhibited significant associations among LCS variables, and thus support that the interpretations made were worth interpretation

However, the observed indicators of the latent construct emotional support from teachers displayed a high average mean value at the first time point (M = 5.31 (SD = 0.75). A total of 43% of the students reported the highest score:

strongly agree about perceiving their teacher as emotionally supportive. Potential ceiling effects may have impaired the reliability of scores (Terwee et al., 2007) and further pose limitations to the inferences made. On the other hand, the inclusion of a robust ML estimator and the use of a bias-corrected bootstrap estimation with a 95% confidence interval (*CI)* to prevent nonnormality may have strengthened the conclusion about statistical validity.

Internal validity is used in this thesis to refer to whether the observed covariation between two variables reflects a causal relationship and whether such a relationship can eliminate any other plausible explanation for that relationship (Shadish et al., 2002).

S*tudy I*'s cross-sectional design lacks temporal directionality, and causal relations are thus not considered. Nevertheless, attempts were made to strengthen the assumed relationships among the variables. This is further supported by the estimation of latent constructs in SEM, which builds on the rationale that a theoretical model is tested against the data. Thus, an acceptable fit for the model may, to some extent, support the relationships between the variables and internal validity.

Although alternative and closely related models were not tested, to eliminate alternative explanations for the relationships among variables, covariates such as students' SES, parents' academic support, and academic performance were included as control variables in the multivariate model.

In *study II*, the estimation of LCS across two time points may have provided more insight into patterns of change as it accounts for measurement error and increases the likelihood that true changes will be detected (Kievit et al., 2018). Nevertheless, using the two time points with parallel changes reduces the potential of making considerations about causality (Shadish et al., 2002). However, the relationships among the LCS in SEM were significant and may have provided a preliminary indication of directionality among the variables. Controlling for gender and students' GPA may support this notion.

Nonetheless, a direct relationship between changes in relationship skills and AEB was unexpected and may reflect spurious effects involving other variables regarding collaborative academic relations that were not included in the model. Since such alternatives were not tested, they may threaten internal validity.

Construct validity concerns whether the instrument captures the concept of what it was intended to measure (Colliver et al., 2012) and whether the inferences drawn from the observed indicators reflect the intended construct (Shadish et al., 2002).

The latent constructs used in *studies I* and *II* were based on theory and tested to determine whether the measures fitted the empirical data in CFA. These processes are known to provide evidence for convergent and discriminant validity as well as supporting the theoretical underpinnings (Brown, 2015). In alignment with this, measurement models exhibited an acceptable fit to the data and provided reasons for assuming a correspondence between the empirical indicators and the constructs' belonging theory. High factor loadings among indicators for latent constructs supported convergent validity, and a relatively low intercorrelation among most of the latent variables reflected that the constructs also purported discriminant validity.

Appropriate evidence of construct validity further depends on the internal consistency of each measure score (Furr & Bacharach, 2014). In *study I*, Cronbach's alpha and McDonald's omega values were used to consider reliability, whereas in *study II*, only omega values were used to report internal consistency. The decision to use omega was due to the highly restricted assumptions made in calculations of alpha. All items are assumed to be unidimensional and to have an equal covariance with the true score (tau-equivalence), which may produce misleading reliability estimates (Trizano-Hermosilla & Alvarado, 2016). By contrast, the use of (general) omega has been observed to overcome these difficulties (McDonald, 1999), as it does not assume tau-equivalence. Its CFA calculation represents associations between the observed indicators and the latent construct. Notably, in cases where Cronbach's alpha is not violated by the data, alpha and omega values yield highly similar results (Revelle & Condon, 2019). Hence, the decision to report both alpha and omega values in *study I* had two purposes: first, to formally provide information about internal consistency among the observed indicators and second, to indicate cases in which Cronbach's alpha was not violated by the data. Based on these assumptions, a relatively high internal consistency was observed for all measures in both studies.

However, Cronbach's alpha and omega for AEB_{T1} differed substantially (α = 0.92 and ω = 0.83) and may warrant some caution in concern considerations regarding construct validity. On the other hand, the differences may also concern the use of several indicators with differing factor loadings (AEB_{T1}0.62-0.82) that violate the assumption of tau-equivalence and lead to overestimation of Cronbach's alpha (Green & Yang, 2009). The higher alpha for AEB_{T1} may also depend on the number of indicators, and 11 indicators of the latent construct may have contributed to a higher Coronach's alpha value. Hence, it was assumed that internal consistency was established.

To further support the reliability of the measures, a strong factorial invariance was established across gender for all latent constructs used in *study I*. In *study II,* a strong factorial measurement invariance was met across the time points and may add to the overall considerations regarding construct validity.

External validity broadly concerns the confidence of inferences made and that results can be generalized across persons, settings, and times (Lund, 2005).

The relatively large sample size (n= 1142) may have contributed to variations that represent the broader population of eighth-grade students. Moreover, the use of FIML under MAR assumption led to the inclusion of parameter estimates for data with missing values (Enders & Bandalos, 2001) and included the whole sample (N=1205) in *study II*, which may support the inferences' generalizability outside the population under study.

Nevertheless, a known threat to external validity occurs when subjects are drawn from restrictive samples (McDermott, 2011), and the present study's sample was limited to a single municipality. Moreover, the municipality's biased inequitable urban location reduces variation owing to the lack of schools within rural areas and may indeed limit the external validity.

Notwithstanding this, the study sample was exposed to interventions intended to nurture students' SECs, which is likely to limit a generalization of inferences made about relations among the variables. However, these considerations also address a future need to replicate study results to ensure that inferences drawn across persons, settings, and time are generalizable to a greater extent. Or, as mentioned elsewhere, owing to all the uncertainty related to statistical inferences, they should be treated as local descriptions of relationships between

assumptions and data rather than as generalizable inferences regarding hypotheses or models (Camerer et al., 2018).

3.5.2 Validity in the qualitative study

Descriptive validity in qualitative research concerns keeping participant statements and behavioral events initially free for researchers' interpretation (Maxwell, 1992). A similar term is credibility (Lincoln & Guba, 1985), which refers to efforts made to handle experiences and perceptions so that they are recognizable to those who participated (Miles et al., 2014).

In *study III*, actions were taken to prevent the data from deviate from the participants' experiences and perceptions. Throughout each of the three focus group sessions, the second researcher assisted and took notes to prevent any loss of expression. Moreover, all focus groups were audio-recorded to preserve the data. This process also involved *interpretive validity* (Maxwell, 1992), which involves preserving the integrity of the participants' perspectives, intentions, cognitions, affect, beliefs, and communication of meaning. In this respect, a summary of each focus group's discussion was provided to the participants at the end of the interview. Any potential disagreement or misunderstanding was agreed on, and the summary was adjusted accordingly. Moreover, a debriefing was held among the researchers at the end of each focus group as well as before the data analysis to identify potential sources of misinterpretation that may have reduced the descriptions, interpretations, and credibility of data. Likewise, to secure descriptive and interpretative validation from the participants and to verify the initial data analysis, a member check was distributed via e-mail urging the participants to provide feedback if the findings were not in alignment with their views (Davis & Lachlan, 2017).

Moreover, and to optimize the discussion among the focus group participants, the open-ended interview guide was piloted. This resulted in adjustments to the content as well as the length. Additionally, the use of extended interviews (Lune & Berg, 2016), i.e., distributing the questions to the participants in advance of the interviews, is assumed to have contributed to participants sharing individual opinions in the group, and hence support the credibility of the study.

Further efforts were made to ensure *theoretical validity* (Maxwell, 1992). Theoretical validity concerns the mental constructions and interpretations intended to describe the participants' perspectives on the phenomenon under study. It thus concerns the validity of the categories' constructs and the way in which the categories are synthesized during the analytic process. Dependability, a closely related term, denotes the degree to which interpretations are consistently made to ensure trustworthiness (Baxter & Eyles, 1997). One means of achieving this is to elaborate on the analytic process.

A qualitative conventional content analysis was used to analyze data (Hsie & Shannon, 2005). This analytic procedure seeks to develop categories directly from the data pertaining to a phenomenon for which knowledge is limited (Erlingsson & Brysiewicz, 2017; Hsieh & Shannon, 2005). Moreover, the initial inductive process of allowing the data to inform the key concepts was assumed to maintain the participant's perspective and to ensure a consistent interpretation of the data. Hence, it is assumed that the choice of analysis supported theoretical validity as well as the dependability of trustworthiness.

Collecting and analyzing qualitative data is concerned with human experiences, which by nature are subject to change. Thus, reflexivity was used to bring beliefs into dialogue and reveal potential biases as well as to acknowledge that the researchers influence the research and the informants' engagement (Curtin & Fossey, 2007). As the focus groups were conducted by the author of this thesis and a researcher, both of whom were involved in developing and piloting ROBUST, efforts were made to reduce potential researcher bias. This prompted them to consider their roles as a moderator during the focus groups and the importance of avoiding any leading questions. However, the informants were aware of the researchers' double role and that ROBUST was under development, with their opinions invited as a central contribution. The openness about these topics may, to some extent, have reduced potential researcher bias regarding the results and, as such, may support the confirmability in the evaluation of trustworthiness (Erlingsson & Brysiewicz, 2017). This does not indicate that the researchers did not influence the informants but rather suggest that efforts were made to minimize such influences. We can never ascertain, however, whether the questions asked during interviews were unaffected by the researchers' positive attitudes toward the content discussed. On the other hand, the discussion was facilitated among

the informants, which may suggest that potential biases were somewhat reduced.

The question of whether the results of *study III* are generalizable builds on considerations of whether the same process may be useful for similar samples and in similar situations (Maxwell, 1992; Maxwell, 2021) and if the results can be transferred to other contexts with other participants by means of how results may advance the understanding relevant in multiple situations (Miles et al., 2014). Building on this, the assumed validity involved throughout the research process may reinforce the results' mirroring of the students' perceived experiences and suggest that they can be transferred to other contexts and processes that are likely to take place among similar groups (Maxwell, 2021). Accordingly, the results are considered informative for advancing practical understanding of the phenomena in question. This further implies that the study findings may be adapted to other situations and contexts alike. However, the potential of transferring study results is further discussed in chapter 5.3.2 about methodological considerations.

3.6 Ethical considerations

The Norwegian Centre for Research data (NSD) approved the formal application of the research conducted in this thesis (Appendix 3). The ethical responsibility for the young participants was taken into consideration both prior to, during, and after the intervention as well as during the data collection.

The students that participated in the ROBUST pilot project along with their parents or guardians were informed about the project and their rights to consent or withdraw from the study at any point. Students received an explicit and age-appropriate information letter. As the participants at the time were minors, their parents or guardians provided formal consent on their behalf. In line with the *Guidelines for Research Ethics in the Social Sciences, Humanities, Law and Theology*, (NESH, 2021), students were made aware that their consent was freely given without any external pressure, such as "the pressure of the researcher or any other authority with whom the researcher has been in contact" (NESH, 2021, p.15).

The class's main teacher was present in the classroom during the survey investigations and supported students if they required help. Before the assessment, all the attending students consented orally to participation and were informed about their rights to withdraw their consent at any time.

Likewise, students were informed that their consent was freely given and that they had the right to withdraw before the focus groups. In light of the students' ages at the time, their parents had signed written consent forms on their behalf. Each focus group was held at the informants' schools to ensure a safe environment. The informants as well as their parents or guardians were assured that data were treated with anonymity.

4 Results

4.1 Main findings study I

This study aimed to investigate how students perceived the SECs of relationship skills, emotional regulation through cognitive reappraisal, and the ability to plan schoolwork and structure homework in association with AEB and emotional distress at the beginning of lower secondary school. In SEM, AEB was treated as an intermediate variable predicted by the other SECs and as a predictor of emotional distress.

A partially mediated model was supported by the data in which AEB—as the intermediate variable—was considered to have a strong negative association with the outcome variable emotional distress (β =-0.29, p<0.001). Moreover, AEB were moderately associated with the independent variables of relationship skills (β = 0.22, p<0.001), emotional regulation through cognitive reappraisal (β = 0.21, p<0.001), and the ability to plan schoolwork (β = 0.16, p<0.001) and structure of homework (β = 0.25, p<0.001).

Emotional distress was moderately associated with relationship skills (β = -0.17, p<0.001) and emotional regulation through cognitive reappraisal (β = -0.11, p<0.001). However, for the students' perceived planning of schoolwork, a weak and positive association with emotional distress was observed (β = 0.08, p<0.05). Furthermore, the moderation of gender in the direct associations between SECs and AEB and emotional distress, respectively**,** was tested by the Satorra–Bentler scaled chi-square difference test. Students' perceived relationship skills, emotional regulation through cognitive reappraisal, and structuring of homework were more strongly related to reduced emotional distress among females. Emotional regulation through cognitive reappraisal and structuring of homework were more strongly related to AEB among females than among males. This was also reflected in the explained variance in SECs and AEB that, for males, accounted for 33% of the variance and 37% for females. The SECs further accounted for 11% of the variance in emotional distress among males, whereas for females the explained variance was 22%.

The findings thus suggest that SECs play a role in AEB and that AEB, relationship skills, and emotional regulation through cognitive reappraisal are

associated with reduced emotional distress. In this regard, increases in relationship skills may enable students to establish supportive relationships that facilitate AEB. Emotional regulation through cognitive reappraisal may help students to regulate the emotions engendered in them in response to academic learning, allowing them to become more optimistic and nurture optimism and AEB with respect to schoolwork. Overall, the results suggest that students' SECs are important with respect to AEB pertaining to schoolwork and for reduction of emotional distress and that SECs are more important for AEB and emotional well-being for females during the first stages of lower secondary school.

Note that the chi-square value of the overall model fit is incorrectly referred to as 0.1645.07 in the article of *study I*. This is a typographical error.

4.2 Main findings study II

This longitudinal study aimed to investigate students' intra-individual changes with respect to relationship skills, emotional regulation through cognitive reappraisal, the perceived classroom relations: emotional support from teachers and collaborative peer relations, and AEB during the first year of lower secondary school. Both the level of change and the relationships between latent changes were examined using latent change score modeling (LCSM).

The SECs, classroom relations, and AEB all showed an average decline during the first year of lower secondary school. The highest negative change was for emotional support from teachers, and the lowest was for relationship skills and emotional regulation through cognitive reappraisal. However, significant variations in change were evident for all study variables, suggesting that adolescence as a period is characterized by ample individual changes across the two time points. The highest variations were observed for relationship skills (s^2= 1.01, p<0.001), and emotional regulation (s^2= 1.25, p<0.001).

Two structural models were estimated. Changes in emotional support from teachers and collaborative peer relations functioned as intermediate variables in each of the models. A strong direct association was found for change in emotional regulation through cognitive reappraisal and AEB in both SEM models ($\beta_{Fig.1}$ = 0.33, p <0.001, $\beta_{Fig.2}$ = 0.34, p <0.001). Moreover, a strong link

was observed for changes in relationship skills and collaborative peer relations (β = 0.46, p <0.001) and emotional support from teachers (β = 0.27, p<0.001), respectively. Indirect associations were observed for changes in the SECs via changes in emotional support from teachers and collaborative peer relations. The strongest association of change was observed for relationship skills and AEB via collaborative peer relations (β = 0.08, p =0.01 (95% *CI* = 0.01-0.15).

The findings suggest that increased emotional regulation through cognitive reappraisal during the first year of lower secondary school is associated with increased AEB. Furthermore, growth in relationship skills is linked to AEB through enhanced classroom relations. The results thus uphold the importance of nurturing adolescent students' relationship skills and emotional regulation to promote supportive classroom relations as well as AEB during the first year of lower secondary school.

4.3 Main findings study III

This qualitative study's main objective was to explore how lower secondary school students experienced learning about relationship skills, emotional regulation, mindfulness, growth mindset, and problem-solving by participating in ROBUST and whether they perceived these competencies as supportive means of coping with academic stress.

With the use of conventional content analysis to analyzing data, two main dimensions were identified: "supportive competencies" and "challenging competencies". The first dimension included the three sub-dimensions of "mindful acceptance," "making plans," and "strengthened motivation." The second dimension contained the sub-dimension "potential benefits and difficulties".

The results suggest that the students perceived the SECs of mindfulness, problem-solving, and growth mindset as supportive in coping with academic stress. Mindfulness was perceived as beneficial for reducing negative thinking about upcoming academic performances and coping with academic stress by becoming more accepting of stressful experiences. Problem-solving, such as when making plans for upcoming academic work, was perceived as supporting the ability to cope with stress, whereas growth mindset was perceived as

assisting students in coping through enhanced optimism with respect to learning and reinforced beliefs in their ability to master future academic challenges.

Emotional regulation and relationship skills were also recognized as somewhat beneficial but more challenging to utilize. As emotional experiences may be perceived as stronger during this stage of life and social relations may be more salient, it may reflect a need for students to engage with more practical experiences to perceive these competencies as valuable in helping them cope with academic stress. Moreover, the results may contribute to knowledge about how nurturing adolescent students' SECs through SEL interventions can build resources to support their coping with academic stress.

5 Discussion

The main research questions for this thesis are how students perceive their social and emotional competencies (SECs) and how these relate to academic efficacy beliefs (AEB) and emotional distress, as well as how students experience an educational intervention that aims to stimulate their SECs and whether they support coping with academic stress. In this chapter, the more specific research questions and findings of *studies I-III* are discussed by the SECs.

5.1 Discussion of the main findings of the quantitative studies

5.1.1 Relationship skills

Findings indicate that student's perceived their relations skills to decrease slightly during the first year of lower secondary school ($M_{\triangle=}$ -0.21; RQ2:1). Adolescence is characterized as a time for growth and sophistication with respect to relationship skills (Lerner & Steinberg, 2009; Steinberg, 2005, 2014), but it is also a time during which students are more prone to social adaption and increased desire to be accepted among their peers (Blakemore, 2019; Blakemore & Mills, 2014). Moreover, the quality of relationships is believed to decline during this time (Ross et al., 2019). As such, the present study's findings may corroborate earlier studies in which students perceive their relationships as more complex and challenging during this period of life (Brown & Larson, 2009; Lerner & Steinberg, 2009). The perception of oneself as lacking optimal relationship skills has been associated with poor ability to cope that can develop into more substantial mental health challenges (Skinner & Zimmer-Gembeck, 2007; Zhang, 2013). However, a significant variation in the development of relationship skills was identified and suggest that not all students perceive decrements in their relationship skills (s^2_r=1.01). Nevertheless, the findings suggest that it is important to nurture students' relationship skills in early adolescence. In alignment with earlier research, more positive developments in relationship skills may function as a resource for coping (Zeidner & Matthews, 2016) and promote the satisfactory establishment

of supportive peer and teacher relationships with respect to students' academic work.

Since much of adolescence is spent in school, good relationships with teachers and peers are likely to nurture students' positive beliefs and expectations regarding their learning. Research has indicated a link between peer collaboration with respect to academic learning and enhanced optimism about one's ability to accomplish more challenging academic work (Claro et al., 2016; Dweck, 2015; Yeager et al., 2018; Yeager & Dweck, 2012). It has also been proposed that being able to establish supportive and caring relations in school are associated with academic motivation (Urdan & Kaplan, 2020; Urdan & Midgley, 2003; Urdan & Schoenfelder, 2006). Moreover, individuals' abilities to regulate their emotions have previously been shown to support the establishment of classroom relationships, as these interactions may involve emotional activation (Camacho-Morles et al., 2019; Kwon et al., 2014; Pekrun, 2017; Pekrun & Linnenbrink-Garcia, 2012). Overall, classroom relationships, such as students' perceived emotional support from teachers and collaborative peer relations, represent environmental factors that are expected to play a significant role in the link between the SECs relationship skills and emotional regulation and AEB across the first year of lower secondary school.

5.1.1.1 Classroom relations as intermediate variables

This section will first discuss findings relating to changes in classroom relations and their role as intermediate variables in the associations between changes in relationship skills and AEB. Changes in classroom relations and their associations with changes emotional regulation will be discussed in the chapter on emotional regulation.

Student's perception of themselves as emotionally supported by the teacher in the classroom has been identified as central to learning quality (Ansari et al., 2020; Pianta et al., 2012; Ruzek et al., 2016; Özdemir, 2020). However, the current findings indicate that students' perceived changes in emotional support from teachers across eighth grade had a strong average decline ($M_{\triangle}$ =-0.43; RQ2:1). A significant variation (s^2 = 0.84) reviled that not all students perceive such a decline. Yet, the average downward trend aligns with existing findings and suggests that students perceive their teachers as less emotionally supportive

during this period (Bru et al., 2010; Lerner & Steinberg, 2009; Murberg & Bru, 2009). According to goal-achievement theory, perceiving teachers as emotionally supportive is central to facilitating a trustful and caring environment that nurtures independence with respect to learning (Ames, 1992; Meece et al., 2006; Patrick et al., 2011). The current average decrease in perceived emotional support may therefore pose a threat to how students perceive being supported in the process of learning.

Findings further indicate a relatively strong average decline in collaborative peer relations about learning during the first year of lower secondary school ($M_{\triangle}$ = -0.33; RQ2:1). In accordance with previous suggestions, the educational structures at secondary level may place higher demands on students than those at the primary level (Fernandez-Rio et al., 2017). This may also impede access to good collaborative processes and provide students with fewer opportunities to establish and experience good collaborative peer relations with respect to learning (Engels et al., 2017; Wentzel & Miele, 2016; Wentzel et al., 2016).

Perceived classroom relationships with teachers and peers are essential to learning and thriving in school (Pianta et al., 2012; Ruzek et al., 2016). The present study's findings regarding declining classroom relationships may align with previous ones and suggest a mismatch between students' perceived needs and the changed social and environmental structures in this period (Eccles, 2004; Eccles & Roeser, 2009). This mismatch may alter perceptions about classroom relationships and create a need to find ways to nurture students' perceived ability to handle classroom relationships with both teachers and peers.

Results from *study II*'s show that associations of changes between relationship skills and emotional support from teachers (β = 0.27, p<0.001) and collaborative peer relations (β = 0.46, p<0.001), were relatively strong (RQ2:3). This may indicate that students' perceived relationship skills help them establish positive classroom relations. In alignment with previous empirical results, it could reflect that more positive changes in relationship skills provide better access to social support for both instrumental and emotional reasons as well as for the establishment of good and authentic interactions (Ruzek et al., 2016; Thoits, 2011). The strongest indirect association of change was for relationship skills via collaborative peer relations with AEB. This supports the

idea that relationship skills nurture a positive establishment of quality peer relations and thereby fuel into students' expectations and beliefs about academic accomplishment (e.g., Furrer et al., 2014).

Regarding *study I*'s cross-sectional findings, a positive association between relationship skills and AEB ($\beta = 0.22$, $p<0.001$; RQ1:1) show that students who perceive themselves as able to establish good relationships may also perceive themselves as having access to academic support and encouragement among their peers (Rose-Krasnor & Denham, 2009; Rubin et al., 2011; Rubin et al., 2006). This has been shown to affect students' beliefs about their ability to master challenging academic work (Dweck & Yeager, 2019; Yeager, 2017). The current findings thus support previous studies suggesting that the establishment of good relationships in school is related to raised academic expectancies, effort, and persistence (Aditomo, 2015; Brougham & Kashubeck-West, 2017; Claro et al., 2016; Dweck, 2015). Moreover, that perceive being able to seek social support fuels students' beliefs about academic mastery (Greenberg & Abenavoli, 2017; Mikami et al., 2017; Putwain et al., 2013).

Findings did also show that intra-individual changes in perceived relationship skills were directly related to changes in AEB ($\beta_{Fig.1} = 0.17$, $p<0.01$/ $\beta_{Fig.2} = 0.14$, $p<0.05$; RQ2:2). This was not anticipated. Instead, it was expected that changes in relationship skills would be indirectly related to changes in AEB via classroom relations. The direct link may thus involve spurious effects, or that not all academic relationships were included as intermediate variables in the model. These include academic collaboration in a broader sense. By contrast, the indirect association of changes via collaborative peer relations and emotional support from teachers with AEB, respectively, support that relationship skills promote the ability to establish good social relations and support in collaborative peer relations which in turn nurture students' positive expectations and effort with respect to schoolwork. This is further aligned with research suggesting a link between the establishment of good relations and optimistic appraisals about AEB (Eckenrode, 2013; Skinner et al., 2013; Struthers et al., 2000).

Study I's findings further demonstrate that having good relationship skills can reduce emotional distress ($\beta = -0.17$, $p<0.001$; RQ1:2). This may be related to the fact that emotional distress tends to surface in adolescence (Bakken, 2018;

Cicognani, 2011; Compas et al., 2001; Eriksen et al., 2017; Moksnes et al., 2014; Seiffge-Krenke, 2013), and perceiving oneself capable of establishing good relationships and social support when needed is most likely to function as a resource for coping and thus buffer against stress (Carver & Scheier, 2017; Thoits, 2011). Moreover, having good relationship skills may provide a sense of relatedness that is shown to buffer against or reduce emotional distress among the young (Ryan & Deci, 2000, 2020; Thoits, 2011).

The findings also reviled that students' perceived relationship skills are indirectly associated with emotional distress via AEB (β = -0.06, p<0.001; RQ1:2). This may to some extent support the notion that students' perceived relationship skills may provide greater access to academic support, which is likely to affect their expectations regarding the role of academic success as a protective factor in lowering emotional distress (Stroebe, 2005; Szkody & McKinney, 2019. Involved are perhaps also optimistic appraisals about coping with academic work that minimize the emotional experiences involved in emotional distress (Blakemore, 2019; Lazarus, 1999). Taken together, previous research has proposed a general link between SECs and the reduction of emotional distress (Durlak et al., 2011; Taylor et al., 2017). *Study I*'s findings suggest a direct link between relationship skills and reduced emotional distress as well as indirect via AEB at the beginning of lower secondary school. In *study II* it is suggested that a more positive development of relationship skills across the first year of lower secondary school is related to more positive perceived classroom relations and thereby with enhanced AEB. Thus, the present study's findings add to existing ones suggesting students' perceived relationship skills to be an important SEC with respect to classroom relationships, optimism about academic work (AEB) and reduced emotional distress during the first year of lower secondary school.

5.1.1.2 Gender differences concerning relationship skills

Having good relationship skills has been shown to alleviate symptoms of emotional distress (Nilsen et al., 2013). Females are known to report higher levels of perceived relationship skills than males (Rose et al., 2011; Rueger et al., 2016). Findings of *study I* show that associations of relationship skills and emotional distress benefit females more than males in terms of alleviating emotional distress (RQ1:3). This is probably reflecting that female relationships

tend to be characterized by greater interpersonal conflicts and self-disclosure, which can increase the risk of emotional distress (Rose & Rudolph, 2006). Female relationships are also more associated with fear of social exclusion, which is a known risk factor for increased emotional distress (Rose & Rudolph, 2006). The results of *study I* may align with earlier studies indicating that the more complex interaction among female students requires better skills to cope adequately in relationships to minimize social stressors associated with emotional distress (Chaplin & Aldao, 2013; Rudolph et al., 2008).

5.1.2 Emotional regulation

Emotional regulation is suggested to provide flexibility in emotionally activating situations (Gross, 2014; Young et al., 2019). Emotional regulation in *studies I* and *II* of this thesis concerns students' perceived ability to cognitively reappraise emotionally activated situations more optimistically (Flouri & Mavroveli, 2013; Gross, 2014; Gross & John, 2003; Koole, 2009; Strain & D'Mello, 2015). The current results indicate an average decrease in emotional regulation through cognitive reappraisal across eighth grade ($M_{\triangle}$ =-0.19; RQ2:1). The finding was unexpected, as previous research has indicated a cognitive growth that fuels the ability to regulate emotions in adolescence (Ahmed et al., 2015; Herd et al., 2020; Silk et al., 2003). Previous research has also shown that early to middle adolescence is a period of significant development in the ability for emotional regulation through cognitive reappraisals. (Silk et al., 2003; Young et al., 2019; Lerner & Steinberg, 2008; Ahmed et al., 2015). The present study's findings, in alignment with existing research may reflect the tendency whereby the young experience more negativity-laden emotional activations that diminish how they evaluate their ability to regulate negative emotions through more constructive cognitive reappraisals (Blalock et al., 2016). Research has demonstrated that adolescence is a period characterized by strong emotional activation that may be challenging to regulate (Lennarz et al., 2019; Spear, 2011). The current findings may thus suggest that nurturing students perceived cognitive reappraisal could facilitate more positive emotional experiences. This further support the notion that being able to cognitively reappraise emotional activating situation alters the emotional experience (Flouri & Mavroveli, 2013; Strain & D'Mello, 2015).

Findings show a relatively strong and direct link between changes in emotional regulation and AEB (β = >0.33, p<0.001; RQ2:2) across the first year of lower secondary school. In line with this, learning activities in school have been shown to engender various emotions (Pekrun, 2007, 2016), and regulation of emotions by cognitive reappraisal may generate more constructive thoughts, optimistic feelings, and behavior (Gross, 2014; Gross & Thompson, 2007). Moreover, constructive thoughts can affect important aspects of the quality of learning, such as memory and cognitive resources (Pekrun & Linnenbrink-Garcia, 2012; Pekrun & Perry, 2014). Thus, the ability to reappraise emotionally activating situations more adequately can generate optimistic emotions (Pekrun, 2016; Pekrun et al., 2007), and engendering motivation with respect to schoolwork. Earlier research has even suggested that cognitive reappraisal is associated with enhanced information processing during learning (Davis & Levine, 2013), which may support increments in motivational processes about academic work (Putwain et al., 2020). Accordingly, a more positive change in emotional regulation may play a central role in enhanced AEB.

The results showed a direct association between students' perceived ability to regulate emotions and AEB (β = 0.21, p<0.001; RQ1:1) in the beginning of lower secondary school. In accordance with previous findings, it may suggest that cognitive reappraisal supports students in coping with academic learning activities (Phillips & Power, 2007; Skinner & Zimmer-Gembeck, 2007; Zimmer-Gembeck & Skinner, 2011). Moreover, that cognitive reappraisal function as a resource for the coping process, in which changing emotional activations with respect to learning to be more optimistic can affect students' beliefs and expectations about their ability to master their schoolwork (Pekrun et al., 2007; Pekrun & Stephens, 2012).

Across eighth grade a weak indirect association of change was found for emotional regulation with AEB via changes in collaborative peer relations (β = 0.03, p = 0.01 (95% *CI*= 0.00–0.06) and via emotional support from teachers in school (β = 0.02, p = 0.01 (95%*CI*= 0.00–0.05; RQ2:3). Although weak, the findings may align somewhat with previous ones and indicate that perceived regulation of emotions by cognitive reappraisal maintain academically supportive classroom relationships by coping in peer relations which engenders motivation and effort in academic work (Järvelä et al., 2010; Pekrun, 2017;

Schunk & Zimmerman, 2007). However, the weak indirect associations may also suggest that changes in perceived classroom relationships play only a minor role in how changes in emotional regulation may induce changes in AEB across this first year of secondary school.

At the beginning of lower secondary school, a weak direct association was found between emotional regulation and emotional distress as well as indirectly via AEB (RQ1:2). In alignment with earlier studies, adequate emotional regulation is associated with good mental health (Pascoe et al., 2020; Thompson et al., 2008) and thus may protect against emotional distress (Aldao et al., 2010; Garnefski & Kraaij, 2006; Gross, 199. Moreover, the indirect association between emotional regulation and emotional distress via AEB may suggest that more constructive reappraisal of learning situations creates optimism and fuels expectations about academic mastery and helps alleviate emotional distress (Lennarz et al., 2019; Shapero et al., 2019; Weinstein et al., 2009).

The findings of *studies I* and *II* suggest that cognitive reappraisal could play an important role in in the development of AEB, during the first year of lower secondary school, a period when academic motivation tends to decrease (Gottfried et al., 2007; Schunk & Meece, 2006; Skaalvik & Federici, 2015).

5.1.2.1 Gender differences concerning emotional regulation

A stronger path of association between emotional regulation through cognitive reappraisal and emotional distress were found for female than for male students (RQ1:3). Females are found to experience emotions stronger as well as to analyze them more negative than males (Chaplin & Aldao, 2013; Nolen-Hoeksema & Aldao, 2011; Thayer et al., 2003; Zimmermann & Iwanski, 2014). This has previously been associated with more negative emotional activations among adolescent females (Bale & Epperson, 2015) and could suggest that females analyze emotional activating situations more negatively than males. The perceived ability to regulate emotions by positive cognitive reappraisals to alleviate emotional distress may thus be more important for female than for male students.

The results show a stronger association between emotional regulation and AEB among females than for male students (RQ1:3). This may align with the notion that adolescent females tend to perceive having lower expectations about schoolwork (Diseth et al., 2014). Engendering more positive emotions by cognitive reappraisal could support optimism about school among female students (Neuman et a., 2010), and the current findings may suggest that females more than male students need to regulate negative emotions for more positive AEB.

5.1.3 Planning and structuring of schoolwork

Planning of schoolwork and structuring of homework are SECs suggested to be central for students' self-management by directing time and actions regarding academic learning activities (Cleary, 2006; Domitrovich et al. 2017; Weissberg et al. 2015; Zimmerman et al., 1996). These SECs are also suggested to work as problem-focused strategies in the process of coping (Aldwin et al., 2011; Ifenthaler, 2012; Skinner & Zimmer-Gembeck, 2007).
The current findings show that students' perceived abilities to structure their homework are directly associated with AEB ($\beta = 0.25$, $p<0.001$; RQ1:1). This may to some extent align with earlier research suggesting a link between structuring of homework and growth in self-efficacy beliefs and academic motivation (Diseth et al., 2014; Schunk & Pajares, 2002; Schunk & Zimmerman, 2012). Homework is, however, suggested to be less structured than work undertaken at school and to require greater self-management (Cleary, 2006; Hong et al., 2009). Hence, students who perceive themselves able to structure how and when to do their homework may engender more optimistic beliefs and expectations about one's ability to manage academic work (Bandura, 2006; Putwain et al., 2018; Valle et al., 2016; Zimmerman et al., 1996).

Students' perceived ability to plan their schoolwork was also positively associated with AEB ($\beta = 0.16$, $p<0.001$; RQ1:1). Similar to previous research, making plans regarding academic activities at school may involve the use of problem-focused coping strategies (Carver et al., 1989; Dinsmore et al., 2008; Diseth et al., 2014; Skinner & Zimmer-Gembeck, 2007). Moreover, active efforts to cope can be associated with a sense of situational control (Doron et

al., 2009; Von Soest et al., 2012; Östberg et al., 2015), and thus support students AEB by growth in beliefs about the ability to manage academic work (Skinner & Zimmer-Gembeck, 2007; Zimmer-Gembeck & Skinner, 2016).

Findings from *study 1* showed that planning of schoolwork and homework only have an indirect association with emotional distress via AEB (RQ1:2). Although very weak, it may align with the notion that being able to self-manage in relation to academic work is likely to also involve optimistic appraisals about coping (Berjot & Gillet, 2011; Skinner & Zimmer-Gembeck, 2007). The current findings may therefore reflect that to perceive being able to making plans in regard to schoolwork as well as to structure homework involves problem-focused coping strategies associated with optimistic academic beliefs, which in turn have the potential to protect against or alleviate emotional distress (Skinner & Zimmer-Gembeck, 2007; Berjot & Gillet, 2011; Lee et al., 2020; Cicognani et al., 2016; McClelland et al., 2015; Skinner, 2016; Wong & Power, 2019).

5.1.3.1 Gender differences concerning planning and structuring of schoolwork

The strength of association between structuring of homework and AEB reviled differences in favor of female students (RQ1:3). This may be in line with the notion that females tend to be more organized in regard to academic work, which may contribute to their greater sense of preparedness with respect to their homework (Klimstra et al., 2009). This could further suggest that the structuring of schoolwork by managing time and behavior support females' optimism regarding academic mastery. Moreover, the strength of associations between structuring of homework and emotional distress (RQ1:3) was also in favor of female students. Previous research has indicated that females report that they perceive academic work as stressful (Bakken et al., 2018; Pascoe et al., 2020; Sletten et al., 2017). Over time, such stress may lead to experiences of emotional distress (Diseth et al., 2014; Kim, 2021). Findings may therefore suggest that females need to structure homework to minimize the risk of developing emotional distress.

5.1.4 Academic efficacy beliefs – changes and association with emotional distress

During the first year of lower secondary school, findings reviled an average decline among the young in regard to the changes in AEB ($M_{\triangle}$ = -0.29; RQ2:1). A significant variation indicates that this is not the case for all students. Nevertheless, this decline in AEB is in line with earlier findings and suggest that students' academic beliefs generally decrease during the first year of lower secondary school (Wang et al., 2017; Gnambs & Hanfstingl, 2016). In Norway, grades are introduced for the first time when students enter lower secondary school. Moreover, increased academic demands and the greater autonomy required with respect to schoolwork at the secondary level may contribute to such a decline (West et al., 2020). The increased self-perception that occurs in adolescence may also negatively impact expectations about one's ability to accomplish academic work, which may challenge students' beliefs as well as diminishing their motivation (Eccles, 2004; Gottfried et al., 2007).

However, AEB's is suggested to be central for students' thriving and learning in school (Dweck & Yeager, 2019; Patrick et al., 2012; Yeager et al., 2019), and in *study I* AEB was significantly associated with lower emotional distress at the beginning of lower secondary school (β = -0.29) (RQ1:2). The findings may align with the notion that to perceive oneself as to succeed academically can protect against or alleviate emotional distress (Deci & Ryan, 2008). School is by the young perceived as important for comprehensive education and for their future lives (Bakken et al., 2018; Marks, 2006), and students' beliefs about their ability to accomplish academic work are assumed to be essential for their well-being at school. Hence, having positive AEB during early adolescence is assumed to be key.

5.2 Discussion of the main findings of the qualitative study

Study III qualitatively explored students' experiences of participating in ROBUST. Using an embedded single case study, two research questions were explored: how students experience relationship skills, emotional regulation, mindfulness, growth mindset, and problem-solving as presented in ROBUST

(RQ3:1) and whether and how these competencies were perceived as supportive for coping with academic stress (RQ3:2). Moreover, if the competencies were not perceived as supportive, it was explored why this was the case.

In response to RQ3:1 about students' experiences with ROBUST, the findings suggest that some competencies were perceived as useful whereas others were regarded as more challenging to utilize. The fact that some of the SECs were perceived as useful may, to some extent, align with existing empirical findings that SEL interventions increase SECs along with reducing emotional distress (Durlak et al., 2011) and enhancing students' performance in school (Corcoran et al., 2018; Sklad et al., 2012; Taylor et al., 2017). However, less is known about students' perceived experiences of learning about SECs in adolescence (Dyson et al., 2019), and *study III*'s findings provide more explicit information about students' experiences of specific competencies as presented in ROBUST. —Two main dimensions of supportive and challenging competencies were identified (RQ3:2). Three sub-dimensions of supportive competencies were mindful acceptance, making plans, and strengthened motivation resulting from growth mindset. Challenging competencies included the sub-dimension of potential benefits and difficulties.

Mindfulness and mindful breathing exercises were perceived as particularly useful for reducing negative thoughts about upcoming academic requirements. This is in line with findings from existing research and suggest that mindful approaches such as an acceptance toward stressful academic situations (Chambers et al., 2009) and drawing attention to the present moment to alleviate stress (Biegel et al., 2009; Broderick & Frank, 2014). A mindful approach can help keep worries and rumination at bay, making it easier for the student to concentrate on academic work (Roemer et al., 2015). The present findings may thus support the idea that being in a mindful state nurtures the ability to choose how to respond to (academic) demands (Tharaldsen et al., 2011) and thereby aids adequate emotion-focused coping by changing the subjective situational meaning (Bishop et al., 2004a; Hill & Updegraff, 2012). Added is also that guided breathing exercises are concrete and likely to be easier to utilize in coping with academic stress.

Problem-solving, including making plans with respect to schoolwork were also perceived by the students as supportive in coping with academic stress.

Problem-solving is characterized by active efforts to handle the situation at hand by problem-focused coping (Berjot et al., 2017; Compas et al., 2001; Lazarus & Folkman, 1984). The findings may thus suggest that making plans and schedules for the accomplishment of academic tasks, increase the perception of control of the learning process and in this way reduce academic stress. Solving problems relates to SRL, which includes structuring of schoolwork (Ifenthaler, 2012; Puustinen & Puulkinnen, 2001; Zimmerman & Schunk, 2001). Goal setting and schoolwork monitoring may provide a sense of control and function as resources to support the coping process.

Notably, active efforts to solve academic problems are something the students are likely to already be familiar with. This could moreover make these strategies as taught in ROBUST easier to understand and utilize. Qualitative findings concerning problem solving strategies are in concert with quantitative findings from *study I,* where planning of schoolwork and structuring of homework—were uniquely associated with AEB and via this with less emotional distress. Supplementing the present study's findings, it may suggest that when students perceive themselves as to have good strategies for working with academic assignments and tasks, this has the potential to stimulate their beliefs in their ability to cope with such challenges and thereby reduce the stress (e.g., Skinner & Zimmer-Gembeck, 2007).

Students perceived learning about growth mindset to be informative regarding their academic work as well as to have strengthened their motivation to learn. A growth mindset helps students understand that intellectual abilities are not fixed at birth; instead, they can develop through effort, persistence, and by trying out strategies that support the learning process (Dweck & Yeager, 2019; Yeager et al., 2012). Having a more growth-oriented mindset has been related to adaptive ways to cope with academic challenges (Blackwell et al., 2007; Dweck & Leggett, 1988; Paunesku et al., 2015; Yeager et al., 2019). The present study's findings may thus reflect that a more growth-oriented mindset contributes to optimistic beliefs and constructive appraisals regarding one's ability to cope with or handle challenging academic work.

Nonetheless, the findings also revealed that while students initially perceived the growth mindset approach as complicated, they gradually recognized its potential to strengthen motivation for engaging positively in challenging

learning tasks. First, such findings may support the idea that a growth mindset is indeed a changeable feature (Aronson et al., 2002; Blackwell et al., 2007; Claro et al., 2016). Second, previous research has identified a link between a growth-oriented mindset and more sustainable responses to challenges and setbacks (Dweck & Yeager, 2019). The present study's findings may thus indicate that learning about growth mindset positively affects how students appraise and cope with academic challenges and setbacks in the school context. The concept growth mindset is closely related to academic efficacy belief (AEB), which is previously associated with lower academic stress (Honicke & Broadbent, 2016). In *study I* AEB was associated with lower emotional distress and may support that growth mindset have the potential to lower academic stress. Moreover, in *studies I* and *II*, a decline in AEB was observed during the first year of lower secondary school. This may suggest a need for students to find ways to strengthen their beliefs in their abilities to cope with schoolwork and that teaching students about growth mindset, may help prevent such a decline. A growth mindset concerns beliefs about academic mastery that can facilitate alternative ways of thinking about learning to strengthen academic motivation. Although this aligns with previous studies' findings (Blackwell et al., 2007; Dweck et al., 2007), teachers have also been shown to play a significant role in nurturing students' mindsets (Dweck, 2015; Schmidt et al., 2015), which may suggest that in order to establish longer-lasting effects among all students in the classroom, it is necessary to emphasize teachers' roles in facilitating a more growth mindset-oriented learning environment (Dweck, 2015; Dweck et al., 2019). However, a recent meta-analytic study found only a small effect for growth mindset interventions in favor of students at risk and those of low socioeconomic status (Sisk et al., 2018). The present study's findings should therefore be interpreted as mere preliminary suggestions, indicating the need for further research about the relationship between growth mindset and academic motivation in early adolescence.

The informants expressed that emotional regulation and relationship skills were more challenging to utilize (RQ3:1 and 3:2). In ROBUST, emotional regulation concerned educating the students in how to identify emotions and the opportunity to cognitively reappraise emotional activating situations by altering the emotional reaction in a more constructive manner. Adolescents' emotional interpretations are shown to be stronger and more negatively interpreted than

during childhood (Chaplin & Aldao, 2013; Skinner et al., 2016). This may partly explain why adolescents find it challenging to regulate their emotions. Moreover, a link between adolescent personality mood traits and emotional regulation is suggested. For example, a study by Gresham and Gullone (2012) found that neuroticism was associated with more negative interpretations of emotions, making cognitive reappraisal difficult to utilize. First, this suggests that the ability to regulate one's emotions through cognitive reappraisal will vary depending on mood and personality traits (Gross & John, 2003; Jaffe et al., 2010), and second, emotional regulation is likely to be perceived as more challenging for those who experience strong and overwhelming emotions. Individual variations among adolescent students may suggest that cognitive reappraisal can be difficult to implement and that it is necessary for adolescents to practice emotional regulation through cognitive reappraisal to a greater extent.

The ability to regulate emotions through cognitive reappraisal links emotions and cognition (Koole, 2009) and is shown to aid in downregulation of stressful situations (Thompson et al., 2008). Moreover, cognitive reappraisal is believed to be a malleable feature that supports more optimistic thoughts, feelings, and behavior (Gross & Thompson, 2007). The cognitive capacity to regulate emotions develops substantially during adolescence (Lerner & Steinberg, 2009; Young et al., 2019). Nonetheless, research suggests that the young engage less in cognitive reappraisal (Lennarz et al., 2019). As cognitive reappraisal involves cognitive efforts to alter emotional activated situations in a more constructive manner, it is also cognitive activities considered to be more abstract. The way it was taught in ROBUST may therefore need to be adjusted. For example, there is assumed to be a need for the young to practiced cognitive reappraisal more in order to find it supportive in coping with academic stress. A decline in emotional regulation through cognitive reappraisal during the first year of lower secondary school emerged in *study II* and may support the idea that the young perceive it as challenging. Furthermore, the findings of *studies I* and *II* indicate that adequate emotional regulation through cognitive appraisal is associated with enhanced AEB as well as reduced emotional distress among adolescent students. This moreover aligns with the notion that emotional regulation is important for good mental wellbeing during this stage of life (Curran et al., 2019; Sweetening et al., 2010).

Although this thesis did not investigate the association between emotional regulation and mindfulness, mindfulness is known to facilitate an attitude of increased acceptance, which can help prevent automatic emotional reactions (Crane & Kuyken, 2013; Garland et al., 2009; Tharaldsen, 2019) and support students' cognitive reappraisal with respect to coping with stressful assignments in school (Roemer et al., 2015). From this, one may assume that mindfulness has the potential to aid cognitive reappraisals of emotionally activating situations and facilitate emotion-focused ways of coping with academic stress. For informative matters, the potential interrelatedness between mindfulness with its acceptance and emotional regulation through cognitive reappraisal may support students perceived abililties to reappraise emotional activating situations in a more optimistic manner. This should, as also suggested elsewhere, be further investigated (Broderick & Jennings, 2012; Kaunhoven & Dorjee, 2021).

The findings for relationship skills indeed reflect that these were perceived as challenging to utilize. A downward trend in relationship quality in adolescence, as suggested by Ross et al. (2019), and a decline in students' perceived relationship skills as well as classroom relations (as indicated in *study II*) do align with previous findings indicating that these skills are perceived as more challenging in adolescence than during childhood (Brown & Larson, 2009). Moreover, the fear of being excluded by one's peers (Dalen, 2014) and increments in adolescent students' perceived loneliness (Bakken, 2019) may also contribute to adolescents' perceptions of relationships as more challenging than before.

Several of *study III*'s participants reported a shift toward more positive interactions among their peers. Uncertainty regarding whether these changes were due to enhanced relationship skills as taught in ROBUST, or if these changes had evolved independently due to time spent toghether, may address a need for students to learn more explicitly about how to use relationship skills in establishing social support for learning. The present study's findings may also indicate that the relationship skills taught were somewhat too abstract to be perceived as useful and that future interventions must promote more concrete operationalized relationship skills for the young. Moreover, relationship skills are shown to be strengthened through mutual, inclusive, and supportive relations (Skinner & Zimmer-Gembeck, 2007; Zhang, 2013)

practiced in social interaction with others in the learning environment (Durlak et al., 2011; Domitrovich). Students perceived relationship skills will thus rely not only on individual capacities but also on how the learning environment provides opportunities to practice the establishment of good social relations (Morin, 2021). The present study's findings may therefore be limited and indicate a future need to also focus on environmental factors, such as supportive teacher and peer interactions in the learning environment. However, the strong association of change between individual changes in relationship skills and collaborative peer relations observed in *study II* suggests that students' perceived relationship skills play a role in establishing more positive social relationships in the classroom.

Having the competence to identify and regulate emotions is important for establishing and maintaining relationships (Strain & D'Mello, 2015; Thompson & Gross, 2007; Thompson et al., 2008). A reciprocal relation between emotional awareness and social support has been identified (Rowsell et al., 2016), and the changes in emotional development and social relations that occur during adolescence may cause students to perceive emotional regulation and relationship skills as more challenging than before (*study II*). Despite such perceptions, emotional regulation and relationship skills indeed emerge as central to adolescent functioning in school. The results from piloting ROBUST are used for further development, and the findings of *study III* thus suggest a future need to adjust how to teach students about relationship skills and emotional regulation.

5.3 Methodological considerations

The three studies' respective limitations are thoroughly reported in each article. This section discusses more general methodological issues. First, methodological considerations about quantitative *studies I* and *II* are provided. Second, the methodological considerations of qualitative *study III* are elaborated on.

5.3.1 Quantitative studies

A convenience and non-probabilistic sample selection was used to collect data for the quantitative studies in this thesis. The student population was relatively

large (n = 1142) and consisted of 11 schools in a single municipality. Concerning sample representativeness, social differences are shown to be low among Norwegian students, and between school differences regarding academic achievement are considered moderate (Marks, 2006). Nevertheless, an assumed higher educational level and prosperity standard for the sample's municipality may have contributed to a higher homogeneity and lowered representativity for eighth-grade students in Norwegian lower secondary schools. From this, it is uncertain whether such differences may have affected students' responses concerning the SECs, which may have further reduced variation and the strength of the associations among study variables.

Furthermore, the data used in *studies I* and *II* were collected by an identical survey at two time points via students' self-reports. Participants were asked to report their perceived SECs and emotional distress. Self-reports can offer a unique and efficient access to perceptual, cognitive, and affective experiences (Karabenick et al., 2007). However, self-reported responses may also contribute to artificial inflation among variables, known as common method variance (CMV) (Jordan & Troth, 2020; Podsakoff et al., 2003; Podsakoff et al., 2012). Research has demonstrated that CMV can account for up to 30% of the variance in surveys (Ostroff et al., 2002), with cross-sectional studies more susceptible owing to the use of single measures by single respondents (Spector, 2006). Thus, efforts were made to reduce CMV with respect to *study I*.

In this regard, questions about self-understanding and emotional states have been shown to enhance respondent motivation and thereby reduce response bias (Podsakoff et al., 2012). As most of the scales included in the survey involved individual perceptions as well as students' self-understanding (Appendix 1), this may have contributed to reducing CMV. Furthermore, the scales that represented the independent and dependent variables were placed separately throughout the survey. Clear instructions for each of the scales throughout the survey are also assumed to have reduced the salience of the linkage between dependent and independent variables and thus lowered CMV (Podsakoff et al., 2012). However, some of the latent constructs measured were rather abstract (e.g., AEB and emotional regulation through cognitive appraisal) and may have been more difficult for students aged 13–14 years to interpret.

A lack of consensus and inconsistency when it comes to assessing SECs has been acknowledged (Mantz, 2017; McKown, 2017, 2019). The existing scales are also suggested to be less suited to capturing individual competencies (Brann et al., 2020). As *studies I* and *II* aimed to obtain knowledge about the roles of specific SECs, established, valid, and reliable scales were selected for the survey (Appendix 1). Additionally, five closely related items were developed to assess students' perceived abilities to establish and maintain good supportive relationships, communicate clearly, and seek social support when needed (relationship skills in *studies I* and *II*). To assess students' perceptions of their collaborative peer relationships in the classroom (*study II*), the pilot project group developed a five-item scale. Procedures aimed at ensuring that measures were reliable and valid were followed. First, we carefully considered whether the items reflected the desired construct. Second, the psychometric analysis of construct validity was assessed using CFA. *Studies I* and *II* report detailed information about the scales' psychometric properties for relationship skills and *study II* does the same for peer collaborative relations.

The lack of consensus about SECs further paves the way for broad definitions and interpretations (Shriver & Weissberg, 2020), prompting the question of whether the studies of this thesis should have included additional and/or alternative scales. For example, students' perceived relationship skills could be extended by using measures to assess behavior and thoughts for establishing relations. The CASEL (n.d.) definition of SECs includes social awareness, and an assessment of social awareness may have supplemented the understanding of relationships among adolescents at school (van de Sande et al., 2019). Moreover, *study II* assessed classroom relations based on students' perceived emotional support from teachers and collaborative peer relationships. A broader assessment of classroom relations may include, for example, students' perceived autonomy support and students' individual perceptions of teachers' support for their autonomous academic engagement and motivation (Jang et al., 2010). This may have contributed to a richer understanding of student–teacher relations in the classroom. As noted in this thesis, emotional regulation through cognitive reappraisal represents only one aspect of adolescent students' emotional regulation. Other aspects such as emotional suppression, mindfulness, and ways of reducing physiological activations could have supplemented the broader concept of emotional regulation as a part of self-

management. Further, AEB includes perceived self-efficacy and growth mindset, which are only two aspects of self-awareness. Other aspects, such as developing interest and a sense of purpose, could have supported a broader understanding. Thus, this thesis only involves aspects of the overall concept of SEC as defined by CASEL (n.d.), and although the concepts were found to be reliable, it is assumed that when measuring only a few aspects of the SECs, the associations among variables may underestimate variation as well as the associations among these coefficients.

Furthermore, the structural models in *studies I* and *II* build on theories in which most SECs are treated as predictor variables. The likelihood that the associations in the models were reciprocal remains unexplored and is further discussed in Chapter 5.5 in relation to suggested avenues for future research.

5.3.2 The qualitative study

The qualitative *study III* was designed as an embedded single case study (Yin, 2009). This was based on the notion that the design is suitable for exploring real-life situations and for providing rich information about a given phenomenon (Creswell & Poth, 2016; Gustafsson, 2017). The embedded single case study design in this study was represented by one municipality in which three sub-units was sampled to maintain demographic variation when collecting data. Thus, the results represent units as well as a more holistic understanding of the phenomenon (Yin, 2009). However, this design differs from multiple case study designs that are suggested to be more substantial and to provide more distinct similarities and differences between cases (Miles et al., 2014; Stake, 1995; Yin, 2009). Replication of study results are also suggested to be a strength in multiple case study designs (Yin, 2009). Hence, the embedded single case study design of *study III* may have limited the study's potential to capture nuances, similarities, and contrasts in the results. However, the primary aim was to explore adolescent students' experiences of learning about SECs and whether and potentially why and how they perceived them as supportive. To the best of our knowledge, little research to date has focused on this topic, particularly in the Norwegian context. An embedded single case study design has further been shown to provide a deeper understanding of the subject at hand (Yin, 2009), as its purpose is to capture information in a more exploratory

manner by asking questions such as how, what, and why (Crowe et al., 2011). It was used in *study III* to gain deeper insight into how students experienced their participation in the piloting of ROBUST and why learning about the SECs as presented was perceived as supportive, which may, regardless of the narrower case design, give room for a deeper understanding of the phenomenon under study as well as potentially practical implications for future adjustments of the intervention.

Sample selection was purposive and stratified as efforts were made to take into account the demographic variation among participants from different schools within the municipality. Furthermore, the random selection within each of the areas concerned a wish for greater variation among the participants' experiences than could have been the case if its selection were based solely on willingness. This was to prevent a potential selection bias. Nonetheless, 10 of the invited students did not participate and provided no reason, which may have reduced the sample heterogeneity and led to more positive perceptions about the phenomena under study. This could further have influenced the potential transferability of results to other contexts and suggest that while the results may be informative for advancing practical understanding, they should be interpreted with caution.

However, the participants recruited were selected based on their anticipated in-depth and detailed information due to their participation in ROBUST. The 26 informants who participated in the focus groups had experienced the phenomena under study, and the data collected was expected to be rich, informative, and sufficient.

Focus groups were used for data collection. Compared to individual interviews, focus groups can generate common ideas because of the synergy created between participants (Krueger, 2014). Moreover, focus groups allow for the exploration of new themes through the group dynamic that may be less accessible in individual interviews (Vogel, 2009). Added to this was the wish to create space for a wide spectrum of opinions. However, focus groups also have their disadvantages: the subjective nature and dependency on the dynamic within the group owing to fears relating to negative sanctions and social desirability have been shown to limit the sharing of private opinions (Smithson, 2000). Thus, the advantages of focus groups may also be a hindrance. More

explicitly, adolescent informants are suggested to be more self-centered and/or conform to group dynamics and less occupied with the content of the focus group (Vogel, 2009). In the present study, group pressure may have led to uniform opinions, which must be taken into consideration when interpreting the results. However, several actions were taken to minimize conformity both prior to during and after data collection. Among these, the role of the moderator in focus groups, extended interviews and member checks which are all discussed more profoundly in the chapter on validity (3.5.2). Furthermore, in the article of *study III*, an overview of the quotes (Table 1) may to some extent support the idea that varied individual voices about the topic contributed to the communicative processes. However, the open-ended questions required to some extent a retrospective view, in which the young had to recall their experiences about participation in ROBUST. This further relies on memory processing, which may have affected the data quality (Morgan & Spanish, 1984). Still, the time span from students participated in ROBUST to the time when the focus groups was conducted was relatively short and may have made it easier to recall these experiences.

The decision to apply conventional content analysis for analyzing data was due to a wish of maintaining the informant's unique perspective (Hsieh & Shannon, 2005). Its initial inductive analytic approach allowed for establishment of key concepts from which codes were identified. These codes were based on students' general perceptions of the SECs as presented in ROBUST. However, the remaining analytic process could be referred to as abductive as the SECs were empirically based and previous knowledge were combined with the initial codes. This further aligns with how abductive analysis combines empirical observations and theoretical propositions (Tavory & Timmermans, 2014). These considerations should be included when reading the results. A wish to know more about adolescent students' experiences of participation in a SEL intervention as well as finding ways to support the adolescent in coping with academic stress led to the decision that such an analytic choice would be adequate.

5.4 Conclusions and practical implications

According to this thesis' findings, students' perceived relationship skills, emotional regulation by cognitive reappraisal, classroom relations, and AEB appeared to decline throughout eighth grade (*study II*). Such decrements may reflect a need to find ways to nurture a more positive development. One way to support resilience and wellbeing among adolescent students in this period may be by stimulating their SECs.

For example, decline in AEB as suggested by *study II* support the existing body of research that expectations, as well as effort and persistence about schoolwork, decrease in adolescence (Frostad, Pijl, & Mjaavatn, 2014; Skaalvik & Skaalvik, 2009; Yeager et al., 2017). This may be related to the changes that occur in lower secondary school, and among these are the increased demands and independence required regarding schoolwork (Eccles, 2004; West et al., 2020). Adolescent students' may need to be supported in their beliefs about their abilities to learn and thrive in school (Patrick et al., 2012; Dweck & Yeager, 2020; Yeager et al., 2019). Findings suggest that emotional regulation through cognitive reappraisal were positively associated with AEB both cross sectionally at the beginning of eighth grade and longitudinally through associations of change throughout that year (*studies I* and *II*). Learning and emotions are interchangeable (Pekrun & Linnenbrink-Garcia, 2012; Pekrun, 2017; Pekrun et al., 2007), and increased demands in terms of learning may challenge students' beliefs about their coping abilities and may thus foster negative emotions, such as hopelessness, anxiety, or even boredom (Pekrun et al., 2010). The ability to cognitively reappraise negativity-laden learning situations more optimistically may engender more positive emotions (Gross & Thompson, 2007) that fuels students' AEB during this first year of lower secondary school. Accordingly, schools should prioritize to nurture adolescent students' emotional regulation through cognitive reappraisal to ensure more optimistic learning experiences among the young.

Decreased classroom relations as well as relationship skills across eighth grade may relate to previous research demonstrating that students perceived quality of relationships declines during adolescence (Ross et al., 2019). However, the current findings suggest that a more positive development of students perceived relationship skills during eighth grade may facilitate growth in AEB via

supportive classroom relations (*study II*). Such findings signal that stimulating students' relationship skills could assists them in establishing high-quality relationships and social support when needed with respect to learning. This is likely to fuel their beliefs about their abilities to cope with challenging schoolwork and AEB. A link between good peer collaboration about academic learning and growth in AEB has previously been identified (Dweck, 2012; Dweck & Yeager, 2019; Yeager, 2017; Urdan & Schoenfelder, 2006). The present findings add to this and suggest that students' perceived relationship skills play an important role in classroom relations with respect to growth in AEB. As starting in lower secondary school usually involves establishment of new classroom relationships with peers and teachers that may challenge academic motivation and learning (e.g., Gnambs & Hanfstingl, 2016), nurturing relationship skills for establishing good relationships that support individual beliefs about accomplishing schoolwork is something that schools indeed should prioritize.

Finding of this thesis further suggests planning schoolwork and structuring homework to be important for more positive AEB (*study I*). This may to some extent support the idea that active efforts to solve problems aid students' perceptions of control and enhance their beliefs about their ability to cope with schoolwork (Zimmer-Gembeck & Skinner, 2016; Dinsmore et al., 2008; Diseth et al., 2014). Suggested is also that females more than males may benefit from structuring homework to support optimism regarding the accomplishment of academic work. Females tend to be more organized about their academic work (Klimstra et al., 2009), and being able to structure homework may provide a sense of preparedness that support optimism about coping with challenging academic work. However, females are previously suggested to be more persistent when encountering academic challenges (Martin & Steinbeck, 2017), and the current findings should therefore be interpreted with care. Nevertheless, these findings highlight several preliminary suggestions in which schools should prioritize to stimulate students planning and structuring schoolwork for raised AEB.

Emotional distress is shown to reduce learning opportunities and lead to more severe mental health difficulties (e.g., Collishaw, 2015). The need for more explicit ways to nurture resilience have been wished for (Rodríguez-Naranjo & Caño, 2016). In this regard, the current finding reflects that promoting

relationship skills and emotional regulation may lower emotional distress at the beginning of lower secondary school (*study I*). Moreover, students perceived ability to structure homework may also, to some extent, play a role in reduced emotional distress via AEB. More than males, females may benefit from improved relationship skills, emotional regulation, and structuring of homework to alleviate emotional distress in this period of early adolescence. More complex relations among female students (Rose & Rudolph, 2006) and the tendency to perceive emotions more strongly than males in adolescence (Lerner & Steinberg, 2009), may reflect a particular need for female students to have these SECs nurtured for lowering emotional distress. Added is that the prevalence of emotional distress typically increases during adolescence (Bakken, 2018; Bor et al., 2014), and the current findings may be informative for practitioners and policymakers with respect to how they may promote resilience at the beginning of lower secondary school.

Students' perceived experiences of participation in ROBUST suggest that mindful breathing exercises can support them in coping with academic stress. Being in a mindful state has also previously been shown to reduce rumination and anxiety while enhancing concentration on academic work (Chambers et al., 2009; Roemer et al., 2008). Moreover, educating students about problem-solving was also suggested in *study III* as a means of supporting students in coping with academic stress. This may involve the use of problem-focused coping, which also previously are shown to be associated with reduced stress (Potrebny et al., 2019; Moksnes et al., 2016). Planning of schoolwork and structuring of homework are also academic activities related to the use of problem-focused coping (*study I*). Findings showed these SECs to be associated with lower emotional distress via raised AEB, which may supplement the notion that teaching students about solving academic problems nurture problem-focused strategies that can fuel beliefs about coping with academic stress (McClelland et al., 2015; Skinner, 2016; Wong & Power, 2019). Education about growth mindset was perceived to strengthen students' motivation for learning and support that growth mindset is linked to adequate ability to cope with academic challenges and setbacks (Blackwell et al., 2007; Paunesku et al., 2015; Yeager et al., 2019). This is further in alignment with earlier interventions aiming at nurturing student's mindset (Dweck et al., 2019; Yeager & Dweck, 2012; Yeager et al., 2017).

However, emotional regulation and relationship skills were by students perceived as beneficial yet more challenging to utilize. This may relate to how the training was operationalized in ROBUST. Research has identified reasons to believe that stimulating relationship skills and emotional regulation supports students' well-being and ability to thrive in school (Durlak et al., 2011; Corcoran et al., 2018; Taylor et al., 2017; van de Sande et al., 2019). The stronger emotional reactions observed in adolescence (Chaplin & Aldao, 2013; Skinner et al., 2016) as well as advancements in social relationships (Brown & Larson, 2009; Lerner & Steinberg, 2009) may point toward a need for more practical experiences for the young to perceive these SECs as supportive. Decrements in emotional regulation and relationship skills across the first year of lower secondary school support this notion (*study II*).

Substantial development for the cognitive capacity takes place in adolescence and is suggested to support students' emotional regulation through cognitive reappraisal (Lerner & Steinberg, 2009; Young et al., 2019). However, the abstract cognitive nature and less use of this competence (Lennarz et al., 2019) may signal a need for more concrete and practical approaches to perceive constructive cognitive reappraisal as a resource among adolescents.

Relationship skills as promoted in ROBUST were not accompanied by measures that aimed at changing the social structures in classrooms. As relationship skills depend on experiences in interactions with peers and teachers, not having such measures included in the intervention may have made it difficult for students to experience their relationship skills as a supportive competence. Previous research has suggested that a whole-school approach that combines teaching about SECs through explicit lectures and in ordinary teaching scenarios that includes the whole school to help maintain students' SECs (Domitrovich et al., 2017; Weissberg et al., 2015). Using a whole school approach in future interventions may thus support students need for more practical experience and to facilitate a more concrete context to operationalize relationship skills as well as for emotional regulation through cognitive reappraisal. These suggested adjustments may therefore add information to future SEL interventions in the context of lower secondary school.

Taken together, students SECs have the potential to raise AEB and lower emotional distress across the first year of lower secondary school. Moreover,

educational SEL interventions like ROBUST may support students experiences of coping with academic stress in a period where high levels of stress are reported (Eriksson et al., 2019; Moksnes & Reidunsdatter, 2019; Potrebny et al., 2019). In this regard, findings of this thesis suggest that lower secondary schools should prioritize supporting the specific SECs- relationship skills, emotional regulation, mindfulness, growth mindset and problem-solving for adolescent students optimal learning and thriving in school.

5.5 Suggestions for future directions

The limitations addressed in this thesis' studies highlight several avenues for further research. The findings regarding the cross-sectional design (*study I*) as well as the two time points used in *study II* are based on theory and limited the establishment of (causal) directionality. This suggests that it will be necessary in the future to include more time-points to better understand how the SECs studied are related to outcomes as well as how they develop across adolescence. Furthermore, the present study's findings merely reflect some preliminary results relating to the intermediate roles of AEB (*study I*) and changes in classroom relations (*study II*) and thus point toward the need for these models to be tested in experimental designs in the future to establish a potential causal mediation. Moreover, the gender differences studied in this thesis were limited to the cross-sectional design, and it will be necessary in the future to explore whether and how these differences may potentially change and develop across time.

Empirical findings indicate that stimulating students' SECs through SEL interventions nurtures growth in these competencies (Corcoran et al., 2018; Durlak, 2016; Sklad et al., 2012; Taylor et al., 2017; Wigelsworth et al., 2016). The need to investigate whether reciprocal relations exist among the SECs was not tested by the empirical methods implemented in this study and require further exploration. For example, previous research has identified a reciprocal relationship between emotions and academic achievement (Pekrun, 2017; Pekrun & Perry, 2014; Putwain et al., 2018; Putwain et al., 2020). Similarly, there may exist a reciprocal relationship between emotional regulation through cognitive reappraisal and AEB, thus reflecting that in addition to the suggested association between emotional regulation and AEB, more positive AEB may

support students' cognitive reappraisal. Moreover, students' relationships in the classroom are characterized as complex multicomponent systems (Ansari et al., 2020). Hence, the present study's findings suggest that growth in relationship skills supports emotional support from teachers and collaborative peer relations. However, functional classroom relations as well as safe and secure learning environments may nurture adolescent students' perceived relationship skills. Indeed, a bidirectional relationship may be present among several of the SECs, and further investigation of such potentials is warranted.

Study III's findings suggest that the SECs mindfulness, problem-solving, and growth mindset were perceived as supportive in coping with academic stress. However, emotional regulation and relationship skills were by the students experienced as more challenging to utilize. In this regard, it is necessary to further explore how SEL interventions such as ROBUST is associated with a whole-school approach that focus on measures aimed at social and learning-related relationships in the classroom as well as for the whole school. This was not the case in *study III* of this thesis, and ROBUST combined with a whole-school approach may to a greater extent facilitate a supportive context that aids in maintaining students' SECs (Barnes et al., 2022; Greenberg & Abenavoli, 2017; Oberle & Schonert-Reichl, 2017). Inclusion of a whole-school approach may also provide students with the time and practice assumed to be important for perceiving the SECs emotional regulation and relationship skills as supportive competencies during early adolescence. As the present study's sample selection was geographically and demographically limited to one municipality by an embedded single case study design. This further signals a need for future studies to employ multiple-case design that will allow the exploration of contrasts and similarities between cases in a more varied sample for a potentially richer understanding of the SECs as promoted in ROBUST.

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Appendices

Appendix 1

The survey

The survey including all the scales used in analysis for *studies I* and *II* of this thesis. Introduction and item wording are in Norwegian

Et forskningsprosjekt om sosial og emosjonell læring

I dette prosjektet undersøker vi hvordan sosial og emosjonell læring kan gi økt motivasjon og god mental helse.

Vi håper du vil dele din erfaring, slik at vi får mer kunnskap om hvordan vi kan styrke ungdommers mentale helse for å bidra til en god skolehverdag.

Hva innebærer det å delta?

Vi vil be deg om å svare på tre digitale spørreundersøkelser i skoletiden. [Den første spørreundersøkelsen får du i dag]. Spørsmålene handler om hvordan du opplever faglige og sosiale sider ved skolen, om din skolemotivasjon, og om følelser som kan oppstå rundt skolearbeidet. Det vil også være noen spørsmål om hjemmesituasjonen din, hvordan du ser på deg selv, og om din mentale helse. Det vil ta ca. 20-40 minutter å svare på undersøkelsen.

Hva skjer med informasjonen om deg?

Alle personopplysninger vil bli behandlet strengt konfidensielt.
Det vil bli opprettet et kodesystem, som forhindrer at opplysninger knyttes til deg som person. Du vil ikke kunne kjenne igjen deg selv eller andre i artikler og publikasjoner fra studien.

Husk at innloggingskoden din er personlig. Riv den i stykker/makuler den etter at du er ferdig.

Frivillig deltakelse

Det er frivillig å delta i studien, og du kan når som helst trekke ditt samtykke uten å oppgi noen grunn. Hvis du trekker deg, vil alle opplysninger om deg bli anonymisert. Dersom du velger å ikke delta, eller du vil trekke deg underveis, vil det ikke ha noen innvirkning på ditt forhold til lærere eller andre ansatte på skolen.

Hvis du får behov for å snakke med noen etter at du har svart på undersøkelsen, ta kontakt med læreren din, som vil snakke med deg eller sette deg i kontakt med noen andre du kan snakke med.

Tusen takk for ditt bidrag!

Edvin Bru
Professor, Læringsmiljøsenteret (UIS)
Epost: **edvin.bru@uis.no**

Er du gutt eller jente?

(1) ❑ Gutt

(2) ❑ Jente

Hvilken skole går du på?

Hvilken klasse går du i?

KLASSEMILJØ

Under er det listet opp noen påstander om klassemiljøet i din klasse.

Hvor enig eller uenig er du i disse påstandene?

Marker det svaralternativet som passer best for deg.

DU OG LÆRERNE DINE

	Helt uenig	Ganske uenig	Litt uenig	Litt enig	Ganske enig	Helt enig
	1	2	3	4	5	6
Jeg kan stole på lærerne mine	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Lærerne mine vil alltid hjelpe meg dersom jeg har problemer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg føler at lærerne mine har tro på meg	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg føler at lærerne mine bryr seg om meg	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg føler at lærerne setter pris på meg	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

SAMARBEID MED MEDELEVER

Hvor enig eller uenig er du i følgende påstander:

	Helt uenig	Ganske uenig	Litt uenig	Litt enig	Ganske enig	Helt enig
	1	2	3	4	5	6
Jeg samarbeider med medelever for å forstå lærestoffet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg hjelper andre elever med å forstå lærestoffet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg oppmuntrer medelevene mine til innsats når de strever med skolearbeidet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Medelevene mine hjelper meg med å forstå lærestoffet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Medelevene oppmuntrer meg til innsats når jeg strever med skolearbeidet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Å TA KONTAKT MED ANDRE

Nedenfor finner du noen påstander om det å ta kontakt med andre. Marker det svaralternativet som passer for deg:

	Helt uenig	Ganske uenig	Litt uenig	Litt enig	Ganske enig	Helt enig
	1	2	3	4	5	6
Jeg blir lett kjent med andre	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg kommer fort i kontakt med andre	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg vet hvordan jeg tar kontakt med andre	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg fanger andres interesse på en positiv måte	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg finner lett noe å snakke med andre om	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Å TAKLE UTFORDRINGER

Det er mange måter å takle utfordringer på. Vi ønsker derfor å spørre deg om hva du gjør når du opplever faglige utfordringer på skolen

Tenk på de siste ukene. Hvordan har du planlagt og håndtert utfordringer eller problemer du opplever med skolearbeidet?

Marker det svaralternativet som passer best for deg.

	Helt uenig	Ganske uenig	Litt uenig	Litt enig	Ganske enig	Helt enig
	1	2	3	4	5	6
Jeg har lagt en plan for hvordan jeg skal gå frem	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg har prøvd å komme fram til en strategi for hva jeg skal gjøre	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg har tenkt på hvordan jeg best kan håndtere problemet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg har tenkt nøye over hvilke steg jeg skal ta	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg har gjort det som må gjøres steg for steg	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

TANKER OM LÆRING OG UTVIKLING

TRO PÅ DEG SELV

Tenk på dine muligheter for å lære og utvikle deg, hvor enig eller uenig er du i følgende påstander?

Marker det svaralternativet som passer best for deg. Det er ingen riktige eller gale svar.

	Helt uenig	Ganske uenig	Litt uenig	Litt enig	Ganske enig	Helt enig
	1	2	3	4	5	6
Jeg kommer til å klare å lære det vi skal ha om på skolen i år	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg kan finne ut av alt, bare jeg prøver hardt nok	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Hvis jeg øver hver dag, kan jeg bli god i nesten hva som helst	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Når jeg har bestemt meg for å få til noe som er viktig for meg, fortsetter jeg å prøve, selv om det er vanskeligere enn jeg hadde trodd	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Jeg er sikker på at jeg vil nå de målene jeg har satt meg	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Når jeg strever med å få til noe som er vanskelig, fokuserer jeg på de fremskrittene jeg gjør i stedet for å bli motløs	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg tror hardt arbeid lønner seg	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Mine evner vokser med innsatsen	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg tror at hjernen kan utvikles på samme måte som en muskel.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg tenker at uansett hvem du er, så kan du gjøre store endringer i dine evner	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg kan endre mitt evnenivå betydelig	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Nedenfor er det en rekke påstander om hvordan du har tilrettelagt for å gjøre lekser den siste uken. Ta stilling til påstandene, og marker det svaralternativet som passer best for deg.

	Aldri	Nesten aldri	Sjelden	Av og til	Ofte	Svært ofte
	1	2	3	4	5	6
Jeg sørger for å ikke bli forstyrret når jeg gjør lekser	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg lager en plan for når jeg skal gjøre leksene	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg gjør alle leksene ferdig før jeg spiller tv-spill eller er med venner	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg forsøker å gjøre lekser på en rolig plass	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg tenker hvordan jeg best kan gjøre leksene før jeg begynner på dem	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

REGULERING OG HÅNDTERING AV EGNE FØLELSER

Nedenfor er flere påstander om hvordan en kan håndtere følelser.

Tenk på hvordan du regulerer dine følelser og marker det svaralternativet som passer best for deg:

	Helt uenig	Ganske uenig	Litt uenig	Litt enig	Ganske enig	Helt enig
	1	2	3	4	5	6
Når jeg ønsker å føle meg gladere, tenker jeg på noe annet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Når jeg ønsker å føle meg mindre dårlig (f.eks. trist, sint eller bekymret), tenker jeg på noe annet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Når jeg bekymrer meg for noe, tenker jeg på det på en måte som hjelper meg til å føle meg bedre	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Når jeg ønsker å føle meg bedre om noe, forandrer jeg måten jeg tenker om det på	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Jeg kontrollerer hva jeg føler om ting ved å forandre måten jeg tenker på	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

HVORDAN HAR DU HATT DET DEN SISTE TIDEN

Under finner du en liste over ulike plager. Har du opplevd noe av dette den siste uken (til og med i dag?)

	Ikke plaget	Litt plaget	Ganske mye	Veldig mye
	1	2	3	4
Plutselig frykt uten grunn	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Følt deg redd eller engstelig	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Matthet eller svimmelhet	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Følt deg anspent eller oppjaget	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Lett for å klandre deg selv	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Søvnproblemer	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Nedtrykt, tungsindig (trist)	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Følelse av å være unyttig, lite verd	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Følelse av at alt er et slit	(1) ❑	(2) ❑	(3) ❑	(4) ❑
Følelse av håpløshet med tanke på framtida	(1) ❑	(2) ❑	(3) ❑	(4) ❑

HJEMMEFORHOLD

Nå kommer det noen spørsmål om deg, din familie, og hvordan dere har det hjemme:

Hvor mange ganger har du og familien reist på ferie sammen i løpet av det siste året? Med ferie menes en tur på hytta, båten, syden, campingplassen eller lignende.

(1) ❑ 0

(2) ❑ 1

(3) ❑ 2

(4) ❑ Mer enn 2

OM FORELDRENE DINE OG SKOLEARBEIDET DITT

Ta stilling til påstandene under, og marker det svaralternativet som passer best for deg:

	Helt uenig	Ganske uenig	Litt uenig	Litt enig	Ganske enig
	1	2	3	4	5
Foreldrene mine er interessert i skolearbeidet mitt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Foreldrene mine hjelper meg med skolearbeidet når jeg ber om det	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Foreldrene mine roser meg ofte for min innsats med skolearbeidet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

Appendix 2

Interview guide

Generelt om ROBUST-undervisningen	**About the ROBUST teaching**
1. Hvordan har det vært å få undervisning i ROBUST?	1. What has it been like to participate in ROBUST?
- Hva har du eventuelt opplevd som positivt? Hvorfor? Kan du gi eksempler	- What have you experienced as positive? Why? Can you give examples
- Hva har du eventuelt opplevd som negativt? Hvorfor? Kan du gi eksempler	- Have you experienced something as negative? Why? Can you give examples
2. Har kurset påvirket hvordan du arbeider faglig alene eller sammen med andre?	2. Has the course affected how you work academically, alone or with others?
- Hvis ja, hvordan?	- If so, how?
- Hvis nei, har du noen tanker om hvorfor ikke?	- If not, do you have any thoughts on why not?
3. Har det å delta på kurset påvirket læringsmiljøet i klassen din faglig på noen måte?	3. Has the participation in the course affected the learning environment in your class academically in any way?
- Hvis ja, hvordan?	- If so, how?
- Hvis nei, har du noen tanker om hvorfor ikke?	- If not, do you have any thoughts on why not?
4. Har kurset påvirket det sosiale miljøet i klassen på noen måte? Hvordan? Gi eksempler	4. Has the course affected the social environment in the classroom in any way? How? Please give examples
- Er klassemiljøet mer støttende?	- Is the classroom more supportive?
- Hvis ja, hvordan?	- If so, how?
- Hvis nei, har du noen tanker om hvorfor ikke?	- If not, do you have any thoughts on why not?

Læring i ROBUST	**Learning in ROBUST**
5. Er det deler av ROBUST du har opplevd som nyttige? Hvis ja, hvorfor?	5. Are there parts of ROBUST that you have found useful? If so, why?
Innen temaene:	Within the topics:
- relasjonsferdigheter	- relationship skills
- følelsesregulering	- emotion regulation
- oppmerksomt nærvær	- mindfulness
- lærende tankesett	- growth mindset
- problemløsning	- problem-solving
6. Bruker du noe du har lært fra ROBUST?	6. Do you use what you have learned from ROBUST?
- Hvis ja, eventuelt hva, hvor og når benytter du det? Gi konkrete eksempler.	- If so, what, where and when do you use it? Please give concrete examples.
- Hvis nei, hvorfor ikke? Hva skal til for at du skal ta slike øvelser/teknikker i bruk?	- If not, why not? What does it take for you to use such competencies?
7. Har du opplevd endring av tanker og/eller handlinger som følge av å være med på ROBUST?	7. Have you experienced a change in thoughts and / or actions as a result of participating in ROBUST?
- Hvis ja, kan du komme med noen eksempler?	- If so, can you give some examples?
-Hvis nei, har du noen tanker om hva som kan være årsaken til det?	- If not, do you have any thoughts on what the reason for that could be?
Erfaring av endringer som følge av ROBUST-undervisningen	**Experience of changes as a result of the ROBUST teaching**
8. Hvis du kommer på noen, fortell om en (eller flere) situasjoner fra din skolehverdag som du opplever at er litt annerledes etter kurset.	8. If yes, please tell us about one (or more) situation from your everyday school life that you experience that are a little different after the course.
Det kan for eksempel være relatert til faglig arbeid på skolen (presentasjoner, gruppearbeid), faglig arbeid hjemme (lekser, lesing til prøver, forberede presentasjoner), noe i friminuttet eller i klassen, noe med lærer, osv.	It can be related to academic work at school (presentations, group work), academic work at home (homework, reading for exams, preparing presentations), something in the free time or in class, something with the teacher, etc.

Appendix 3

Approval from The Norwegian Centre for Research data (NSD)

Edvin Bru
Postboks 8600 Forus
4036 STAVANGER

Vår dato: 25.04.2018 Vår ref: 60207 / 3 / LH Deres dato: Deres ref:

Tilrådning fra NSD Personvernombudet for forskning § 7-27

Personvernombudet for forskning viser til meldeskjema mottatt 06.04.2018 for prosjektet:

60207	*ROBUST - Læring, trivsel, motivasjon og psykisk helse i ungdomsskolen*
Behandlingsansvarlig	*Universitetet i Stavanger, ved institusjonens øverste leder*
Daglig ansvarlig	*Edvin Bru*

Vurdering

Etter gjennomgang av opplysningene i meldeskjemaet og øvrig dokumentasjon finner vi at prosjektet er unntatt konsesjonsplikt og at personopplysningene som blir samlet inn i dette prosjektet er regulert av § 7-27 i personopplysningsforskriften. På den neste siden er vår vurdering av prosjektopplegget slik det er meldt til oss. Du kan nå gå i gang med å behandle personopplysninger.

Vilkår for vår anbefaling

Vår anbefaling forutsetter at du gjennomfører prosjektet i tråd med:

- opplysningene gitt i meldeskjemaet og øvrig dokumentasjon
- vår prosjektvurdering, se side 2
- eventuell korrespondanse med oss

Meld fra hvis du gjør vesentlige endringer i prosjektet

Dersom prosjektet endrer seg, kan det være nødvendig å sende inn endringsmelding. På våre nettsider finner du svar på hvilke endringer du må melde, samt endringsskjema.

Opplysninger om prosjektet blir lagt ut på våre nettsider og i Meldingsarkivet

Vi har lagt ut opplysninger om prosjektet på nettsidene våre. Alle våre institusjoner har også tilgang til egne prosjekter i Meldingsarkivet.

Vi tar kontakt om status for behandling av personopplysninger ved prosjektslutt

Ved prosjektslutt 31.12.2022 vil vi ta kontakt for å avklare status for behandlingen av personopplysninger.

Se våre nettsider eller ta kontakt dersom du har spørsmål. Vi ønsker lykke til med prosjektet!

Dokumentet er elektronisk produsert og godkjent ved NSDs rutiner for elektronisk godkjenning.

Vennlig hilsen

Marianne Høgetveit Myhren

Lise Aasen Haveraaen

Kontaktperson: Lise Aasen Haveraaen tlf: 55 58 21 19 / Lise.Haveraaen@nsd.no
Vedlegg: Prosjektvurdering

Personvernombudet for forskning

Prosjektvurdering - Kommentar

Prosjektnr: 60207

FORMÅL
Formålet med prosjektet er å utvikle og teste et undervisningsopplegg (ROBUST) som er ment å styrke ungdomsskoleelevers sosiale og emosjonelle kompetanse, samt å øke elevenes motivasjon for skolearbeidet. Effekter av intervensjonen på trivsel, motivasjon, psykisk helse og skoleprestasjoner vil undersøkes. I tillegg vil elevenes og lærernes opplevelser av undervisningsopplegget undersøkes.

UTVALG OG REKRUTTERING
Utvalget består av elever i 8. klasse ved Bærum skole i skoleåret 2018/2019, samt lærere som underviser i ROBUST. Skoleadministrasjonen i Bærum kommune oppmuntrer alle skolene i kommunen til å være med i prosjektet. På skoler som ønsker å delta, får elevene med seg et informasjons- og samtykkeskriv hjem. Lærerne mottar informasjonsskriv direkte fra skoleadministrasjonen.

METODE
Ungdomskoler i Bærum vil skoleåret 2018/19 bli tilbudt nye undervisningsopplegg spesielt utviklet for prosjektet. Deltakende åttendeklasser fordeles tilfeldig til en intervensjons- eller kontrollgruppe. Klassene som trekkes til intervensjonsgruppen vil motta ROBUST-intervensjonen. Klassene som kommer i kontrollgruppen vil få et alternativt undervisningsopplegg.

Data samles inn gjennom elektroniske spørreskjema, samt personlig intervju og gruppeintervju. I tillegg vil Bærum kommune gi tilgang til informasjon om elevenes karakterer, fravær og resultater på kartleggingstester på ungdomsskolen, nasjonale prøver for 5., 8. og 9. klasse, informasjon om kjønn, fødselsmåned, klasse og skole, samt løpenummer (istedenfor elevenes navn).

Elevene vil svare på spørreskjema rett før og etter intervensjonen, samt ved slutten av 8. klasse og igjen i 9. klasse. Intervjuer med lærere og utvalgte elever foretas etter intervensjonen er gjennomført.

Det fremgår av meldeskjema at dere vil behandle sensitive opplysninger om helseforhold.

INFORMASJON OG SAMTYKKE
Dere har opplyst i meldeskjema at utvalget vil motta skriftlig informasjon om prosjektet, og samtykke skriftlig til å delta. Barnas foreldre samtykker på vegne av sine barn. Vår vurdering er at informasjonsskrivene til utvalget stort sett er godt utformet, men vi ber om at følgende tilføyes/endres:

I informasjonsskrivet til foreldrene må det legges til at spørreskjemaet også inkluderer noen spørsmål om foreldrenes sosioøkonomiske bakgrunn. Videre bør det tydeliggjøres at dere vil få tilgang til resultater på nasjonale prøver fra 5., 8. og 9. klasse, samt opplysninger om kjønn, fødselsmåned, klasse og skole.

- slette direkte identifiserbare opplysninger som navn, fødselsnummer, koblingsnøkkel
- slette eller omskrive/gruppere indirekte identifiserbare opplysninger som bosted/arbeidssted, alder, kjønn
- slette lydopptak

For en utdypende beskrivelse av anonymisering av personopplysninger, se Datatilsynets veileder:
https://www.datatilsynet.no/globalassets/global/regelverk-skjema/veiledere/anonymisering-veileder-041115.pdf

Articles

Study I

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Associations of social and emotional competencies, academic efficacy beliefs, and emotional distress among students in lower secondary school

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Abstract
This cross-sectional study aimed to investigate how perceived social-emotional competencies (SECs), relationship skills, emotional regulation, and the ability to structure schoolwork at school and at home were associated with academic efficacy belief (AEB) and emotional distress among 1142 Norwegian eighth-grade students. The students answered an Internet-based questionnaire during school hours. Structural equation modeling was used to assess the paths of associations. In the structural model, AEB was treated as an intermediate variable predicted by the other SECs and as a predictor of emotional distress. Perceived relationship skills, emotional regulation, and the ability to structure schoolwork showed moderate to strong associations with AEB. AEB showed a strong association with emotional distress, whereas relationship skills and emotional regulation showed a moderately strong association with emotional distress. The results suggest that all SECs play a role in AEB, whereas high AEB, good perceived ability for emotional regulation, and relationship skills are linked to less emotional distress. Good perceived relationship skills, emotional regulation, and structuring of schoolwork were more strongly related to less emotional distress among females. Moreover, emotional regulation and structuring of schoolwork were more strongly associated with AEB for females. These findings may indicate that these SECs may be more essential to emotional well-being among female adolescent students.

Keywords Relationship skills · Emotional regulation · Planning schoolwork · Structuring homework · Academic efficacy beliefs · Emotional distress

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1 Introduction

Research suggests that enhanced social-emotional competencies (SECs) in general reduce emotional distress (ED) and stimulate academic efficacy belief (AEB) among young adolescents (Durlak et al., 2011; Taylor et al., 2017). However, knowledge about how specific SECs are linked to AEB and ED in early adolescence is scarce (Jagers et al., 2015). The aim of this cross-sectional study, therefore, is to investigate how SECs (relationship skills, emotional regulation, and the ability to plan schoolwork and structure homework) are associated with AEB and ED among a sample of Norwegian eighth-grade students. AEB will be treated as an intermediate variable predicted by the other SECs and as a predictor of ED.

1.1 Emotional distress

Adolescents frequently encounter various stressors that pose potential threats to their healthy development. Stress among the young is increasing and an issue of concern (Eriksen et al., 2017). In Norway and other Western countries, a large proportion of adolescents report high levels of ED (Östberg et al., 2015). Reports of stress have increased over time, and school is among the main sources of stressors (Bakken et al., n.d.). ED denotes unpleasant emotional reactions that may influence students' level of functioning. A high level of ED is an indicator of possible mental health problems (Strand et al., 2003). As such, it is important to investigate how social and emotional competencies relate to ED. An earlier meta-analysis by Durlak et al., (2011) indicated that interventions aimed at increasing students' SECs reduced their ED. However, relatively few studies have investigated SECs in early adolescence (Jagers et al., 2015). Insight into the links between specific SECs and ED could help to inform future interventions aimed at enhancing SECs among adolescent students.

SECs can help adolescents cope adequately with the demands and stressors of daily life and thereby reduce the risk of ED (Durlak et al., 2011; Sande et al., 2019). SECs may also increase the likelihood that individuals' basic needs—such as the needs for competence and relatedness will be met, further minimizing the likelihood of ED (Deci and Ryan, 2008; Ryan and Deci, 2001). Ability to plan schoolwork and structure homework and one's optimism about one's ability to master schoolwork are likely linked to individuals' perceptions of their academic competence. Relationship skills are likely to be central in satisfying the need for relatedness (Deci and Ryan, 2008). Moreover, the ability to emotionally self-regulate could help to reduce conflict in relationships and thus help maintain supportive relations (Gross, 2002; Lopes et al., 2005). Further discussion of the possible links between ED and various SECs will be presented in the chapters that follow.

1.2 Academic efficacy beliefs

AEB is an aspect of self-awareness or, more specifically, academic optimism (Durlak et al., 2011). In this respect, AEB is considered a SEC. Moreover, in the present

study, the analytic model is based on the assumption that other SECs, such as relationship skills, emotional regulation, and the ability to plan school and structure homework, influence AEB, which, in turn, is believed to influence ED. AEB is therefore treated as an intermediate variable. AEB is defined in this study as one's belief in their ability to accomplish challenging tasks and that their ability can grow with effort (Gaumer Erickson et al., 2016). This definition is inspired by social cognitive theory (Bandura, 1997) and Dweck's (1999) growth mindset approach, both of which concern students' beliefs regarding their ability to master academic tasks.

According to social cognitive theory, academic self-efficacy is students' confidence in their personal ability to engage in the behaviors required to produce a desired academic outcome (Bandura, 1997; Maddux, 2016). Efficacy beliefs may concern specific school subjects but may also be generalized through "transformed experiences" into a broader domain, such as the school curriculum as a whole (Kleppang and Hagquist, 2016). Students' transformed experiences can be linked to a growth mindset in that it concerns students' beliefs that ability is developed through effort and perseverance and that attributes such as personality and intelligence are malleable (Dweck, 1999). This is likely to engender optimism and enhanced confidence in their capacity for academic success (Dweck, 1999; Yeager and Dweck, 2012). This is supported by previous studies in which efficacy beliefs as well as a growth mindset are positively associated with academic performance and achievement in school (Honicke and Broadbrent, 2016; Claro et al., 2016).

Research suggests that the connection between perceived academic challenges and ED has intensified among adolescent students (Bakken, 2019; Scrimin et al., 2018). Considering that the students included in this study are at an early stage of lower secondary school, it is particularly appropriate to assess the association between AEB and ED. Eriksen et al., (2017) claim that school-related stress is a key factor in ED among young people. Therefore, belief in one's ability to master academic challenges is likely to reduce perceived school-related stress. Higher AEB is therefore assumed to be related to reduced ED.

1.3 Social and emotional competencies

In this study, SEC is broadly defined as the ability to understand, manage, and express the social and emotional aspects of one's life (Dias et al., 1996, p. 2). This definition links to the framework of the Collaborative for Academic, Social, and Emotional Learning (CASEL n.d.), which presents SEC as encompassing five dimensions: relationship skills, self-management, self-awareness, social awareness, and responsible decision-making. This study will investigate competencies pertaining to relationship skills, self-management, and self-awareness. Relationship skills will be represented by students' perceived ability to establish relationships with peers, while perceived ability of emotional regulation and two indicators of perceived ability to structure schoolwork (planning of schoolwork and structuring of homework) will represent self-management. Finally, AEB will represent self-awareness.

1.3.1 Perceived ability to establish relationships with peers

The ability to establish relationships is an essential aspect of relationship skills that leads to positive social outcomes (Greenberg et al., 2017). Students' perceived relationship skills relate to positive beliefs about coping in a social context (Eckenrode, 2013). Relationship skills may be particularly relevant today because a higher percentage of young people experience difficulties establishing social relationships (Eriksen et al., 2017). Positive relationships contribute to fulfilling the central human need of relatedness, and supportive relationships with others are crucial for the well-being of human beings (Niemiec and Ryan, 2009; Ryan and Deci, 2017). Adolescents with good relationship skills exhibit fewer adjustment problems and report lower levels of ED (Malecki and Elliot, 2002). This may be attributed to the ability to establish social relations with peers, which provides social support when needed (Thoits, 2011). However, the stress-buffering effects of support from adolescent peers are somewhat inconsistent (Murberg and Bru, 2009; Rueger et al., 2016). This may indicate that early adolescents vary in their ability to gain appropriate support from peers.

Previous research has found that students with good relationship skills tend to exhibit greater school engagement and exert greater academic effort (Kwon et al., 2014). However, peer influences on AEB are likely to vary depending on the peer group to which the student belongs. If a student's peer group exhibits low AEB and swiftly abandons academic challenges, the student may model these beliefs and behaviors, and the influence on their AEB will be negative (Yang et al., 2018). However, belonging to a peer group who believe themselves capable of managing academic challenges may boost the student's AEB (Lynch et al., 2013; Rubin et al., 2008). Competence in establishing supportive relationships with peers at school may make it easier for students to integrate with peer groups who have positive academic aspirations and AEB. It is therefore expected that perceived ability to establish relationships with peers at school will be positively associated with AEB.

1.3.2 Emotional regulation

Reappraisal is a cognitive aspect of emotional regulation, a controllable process that directs and refines the perception of a situation to create a more positive perspective (Gross, 2015; Gross and Thompson, 2007). This is an aspect of self-management (Durlak et al., 2011; Taylor et al., 2017). The ability to reappraise situations more beneficially has been shown to contribute to the regulation of unpleasant emotions (Gross, 2013; Webb et al., 2012). Moreover, emotions are strongly related to students' motivational beliefs in an academic context (Pekrun and Linnenbrink-Garcia, 2012; Pekrun et al., 2002). Positive academic emotions reflect students' anticipations of enjoyment, hope, pride, and joy related to learning situations, whereas negative emotions arouse emotions such as anxiety, distress, and hopelessness (Pekrun, 1992). Thus, students' ability to regulate emotions more positively in an academic context may be crucial for their AEB (Boekaerts et al., 2015; Pekrun and Linnenbrink-Garcia, 2012). Given the increased independence and new demands associated with adolescence, adolescents, in particular, may need to regulate their emotions in

response to various stressors. Hence, we expect that the perceived ability to emotionally regulate will be associated with ED. It is also expected that the ability to regulate emotions will be associated with AEB.

1.3.3 Structuring of schoolwork

Academic demands and challenges increase in lower secondary school and require students to become more self-directed in their academic work (Yeager, 2017). The ability to structure schoolwork requires individuals to self-manage their time and behavior to optimize learning possibilities (Domitrovich et al., 2017; Weissberg et al., 2015). In this study, the structuring of schoolwork includes two aspects: the perceived ability to plan schoolwork and the perceived ability to structure homework.

Self-management strategies, such as planning, which create a perception of control, are found to reduce ED (Doron et al., 2009; Östberg et al., 2015). Studies have also indicated a positive link between academic self-management strategies and AEB (Dinsmore et al., 2008; Diseth et al., 2014).

In addition to planning academic work in the school setting, this study focuses on the structuring of homework, which is typically less structured by others than in-class studying. Support for the structuring of homework is likely to vary more between students, depending on how the home environment facilitates homework (Hong et al., 2009). Homework, therefore, places greater demands on students' self-management skills (Dent and Koenka, 2016; Gebauer et al., 2019). Students who are successful in structuring their homework are found to have higher AEB (Putwain et al., 2013). Studies have also indicated that adequate time and behavioral management in relation to homework influence optimistic beliefs about future academic mastery (Valle et al., 2016).

Based on earlier findings, students' perceived ability to plan schoolwork and structure homework is expected to be associated with higher AEB and lower ED either directly or indirectly via AEB.

1.4 Gender differences

More adolescent females than males report having experienced ED (Eriksen et al., 2017; Moksnes and Lazarewicz, 2019). Furthermore, they appear to experience higher levels of negative emotion (Chaplin and Aldao, 2013). Evidence also suggests that females are more easily emotionally activated and display a greater variety of emotions (Neumann et al., 2010). Females also seem to have higher levels of neuroticism, which may predispose them to responding negatively to perceived threats (Weisberg et al., 2011). These findings indicate that gender differences may make emotional regulation skills more essential for females than for male adolescents.

As adolescence begins, female and male relationship tendencies appear to diverge (Chaplin and Aldo, 2013). Males have more hierarchical organized peer groups that focus on activities. Females, by contrast, engage in dyadic relations characterized by cooperative prosocial behavior and self-disclosure. Males' relationships may,

therefore, be more structured and less dependent on individual relationship skills, whereas female peer interactions likely require more elaborate relation skills to get supportive feedback and feel socially included (Albano and Krain, 2005; Rose and Rudolph, 2006). Therefore, the link between relationship skills and ED may be stronger among females.

Females tend to be more academically motivated than males (Diseth et al., 2014). However, they also appear to experience more school-related stress, which may be related to lower perceived AEB (Bakken, 2019). This could make some SECs particularly critical in maintaining AEB among females. Pekrun and Stephens (2012) suggest that emotions are closely connected to academic motivation, in which AEB is an essential component, and it is therefore likely that good emotional regulation could help to maintain AEB. Since adolescent females appear to invest more effort in schoolwork, emotional regulation may be more closely linked to AEB among females. Higher academic investment among females may also suggest that the ability to structure schoolwork is perceived as more critical and may indicate a stronger relationship with AEB among females.

The study of how gender differences impact the strength of the associations between SECs, AEB, and ED should be considered exploratory with no expectations made.

1.5 Research questions

1. To what extent are relationship skills, emotional regulation, and structuring of schoolwork associated with AEB?
2. How are relationship skills,[1] emotional regulation, structuring of schoolwork, and AEB associated with ED?
3. To what extent do these associations differ between female and male students?

2 Methods

2.1 Participants and procedures

The sample of this cross-sectional study consisted of 1147 eighth-grade students (corresponding to the age of 12–13 years). Students were recruited from 54 classrooms in 11 lower secondary schools in a municipality in a middle-sized county in east Norway. Five subjects were removed from the data set (0.5%) due to poor response quality. The balance between girls and boys was 51% over 49%, respectively.

[1] The cross-sectional design of this study lacks time precedence, and indirect effects do not signal mediation (Kline 2015). The term "indirect effect" simply implies directional assumptions under the theoretical rationale that various SECs reduce emotional distress through AEB.

Assessments took place in September 2018, shortly after the students commenced eighth grade. An Internet-based questionnaire was completed during a 45-min lesson.

The study was reviewed and approved by the Norwegian Centre for Research Data (NSD) on behalf of the Norwegian Data Protection Authority. The NSD were satisfied that the study protocol met the ethical standards required for good practice.

All parents or guardians received an information letter. Additionally, the students received an age-adjusted information letter about what participation in the study would involve and stating that they could withdraw their participation at any time. Only students with written consent from parents or guardians were allowed to participate in the study.

The translations of the measures in the study were completed following recommended procedures for cross-cultural adaption (Beaton et al., 2000; Gjersing et al., 2010). First, lingual experts translated the English worded scales into Norwegian and back to English. Subsequently, an expert group oversaw the adaptation of the items' wording and content to a Norwegian context.

2.2 Statistical data analysis

2.2.1 Analytic overview

Descriptive data analysis reported mean and standard deviation for all scales of the total sample, male and female groups, respectively. Pearson product-moment coefficients were computed for the correlation between study variables in the overall sample and the female and male groups. The Statistical Package for the Social Sciences (SPSS), version 25, was used for these analyses.

Confirmatory factor analysis (CFA) was used to test the fit of the measurement models. Following the recommendations of Jöreskog (1993), measurement models were first investigated individually to fit the data and included in a model in accordance with stepwise regression techniques with an increasing number of constructs to ensure discriminant validity. The latent independent variables—relationship skills, emotional regulation, planning of schoolwork, and structuring of homework—were tested simultaneously in a measurement model. The same procedure was followed for the latent dependent variables of ED and AEB. As some variables in this study exceeded the suggested cut-off value for skewness and kurtosis, the recommendations by Chou and Bentler (1995) were followed using a robust ML-estimator to obtain reliable statistical results, as the assumptions of underlying parametric testing were not met.

To assess the models' goodness of fit, the guidelines developed by Hu and Bentler (1998) were followed using a cut-off value close to 0.08 for standardized root mean squared residual (SRMR), accompanied by the Tucker-Lewis Index (TLI) (Tucker and Lewis, 1973) and the comparative fit index (CFI), with cut-off values close to 0.95. Additionally, the root mean square error of approximation (RMSEA) was calculated with a cut-off value of 0.06 or less indicating a good fit and 0.08 as

an acceptable fit, supplemented by a 90% confidence interval (CI). All scales were also tested for internal consistency. Detailed results are provided in "Appendix" A.

Measurement invariance was tested for all constructs separately and in combination. Three models with increased restrictions on model parameters were tested against one another. The baseline pattern-model (configural invariance) was tested against the more restricted weak factorial invariance and displayed no worse fit to the model assuming metric invariance. The metric model was tested against a model with equally constrained intercepts and factor loadings. Detailed results are provided in "Appendix" B.

A structural model with latent variables was used to test the path of association between constructs using Mplus version 8.3 (Muthén and Muthén, 2016).

ED and AEB were treated as dependent latent variables, whereas relationship skills, emotional regulation, and structuring of schoolwork were treated as independent latent variables. AEB was also treated as an intermediate variable between the other SECs and ED. To test whether gender moderated any of the structural paths, a multi-group approach was used. The chi-square difference test with scaling correction was used to compare the nested models (Satorra and Bentler, 2001).

The amount of missing data for the control variable used to assess students' basic academic performance in Norwegian reading, English, and math ranged from 20.1 to 21.4%, and these data were missing completely at random, χ^2 (df = 7) = 5.94, $p = 0.55$ (Little, 1988). Accordingly, the model parameter was estimated using listwise deletion (Enders, 2010).

2.3 Measures

All scales in the questionnaire had introductory texts. Information about the items' wording, the introductory text for the scales, and reliability may be found in "Appendix" A.

2.3.1 Emotional distress (ED)

ED was assessed by the Hopkins Symptoms Checklist 10-item version (HSCL-10) (Derogatis et al., 1974; Strand et al., 2003). The scale's statements were designed to capture different conditions of emotional distress, such as anxiety (e.g., "*Sudden fear for no reason"*) and depression (e.g., *"Feeling that everything is a waste"*). Items had four response options: *Not at all*; *A little*; *Quite a bit*; and *Extremely*. CFA yielded an acceptable fit for a one-factor solution, including the error terms for the items displayed above, which are believed to measure additional perceptions of negative emotions. The omega value indicated a high internal consistency of 0.90.

2.3.2 Academic efficacy beliefs (AEB)

AEB was assessed using a scale developed and described by Gaumer Erickson and Noonan, (2018). The scale is based on the understanding that AEB consists of an individual's belief in their ability to accomplish specific challenging tasks and that

this ability grows with effort (e.g., "*I can figure out anything if I try hard enough*") and students' beliefs about academic challenges (e.g., "*When I have decided to accomplish something that's important to me, I keep trying to complete it, even if it is more difficult than I thought*.") Two items from the original scale were omitted from this study because of their culture-specific formulations that were not applicable to the Norwegian educational context. The scale consisted of 11 items on a six-point Likert scale (*I totally disagree* to *I totally agree,* scored from 1 to 6). CFA yielded results indicating that the items reflect one latent construct. The omega value was 0.83.

2.3.3 Relationship skills

The perception of the ability to build relationships with others was used as an indicator of relationship skills. The scale was developed for this particular study and included the following items: "*I get to know others easily*", "*I get in touch with others quickly*", "*I know how to make contact with others*", "*I capture the interests of others in a positive way*", "*I easily find something to talk to others about*". The scale adopted a six-step scoring format (from 1 to 6): *Strongly disagree, disagree, disagree a little, agree a little, agree, strongly agree*. CFA indicated that the scale yielded good fit, including the error terms for "*I get to know others easily*" and "*I get in touch with others quickly*," probably indicating that, in addition to reflecting this latent construct, these items also measure individuals' perceptions of how quickly they make contact with others. The omega value was 0.91.

2.3.4 Emotional Regulation

The five-item *Reappraisal* subscale from The Emotion Regulation Questionnaire for Children and Adolescents (ERQ–CA; Gullone and Taffe, 2012), was used to assess students' regulation of their emotions (e.g., "*When I want to feel happier, I think about something else*," "*I control my feelings about things by changing the way I think*.") The subscale had a six-step scoring format (from 1 to 6): *Strongly disagree, disagree, disagree a little, agree a little, agree, strongly agree*. Due to the similar wording, it allowed for correlation of residuals between the items "*When I want to feel happier, I think about something different*" and "*When I want to feel less bad [e.g., sad, angry or worried], I think about something different*". Correlations between the same residuals were equally evident in an earlier study that applied the scale among a similar age group (Gullone and Taffe, 2012). The measurement model promoted a good fit when error terms were included. The omega value was 0.88.

2.3.5 Structuring of schoolwork

Two scales assessed the students' ability to structure their schoolwork. The *Planning* subscale from the Coping inventory, which assesses different types of coping strategies (Carver et al., 1989), was implemented to measure planning as a problem-focused coping strategy related to schoolwork. The subscale has five items, for example, "*I make a plan of action*," "*I try to come up with a strategy about what to do*". The introduction

was designed to relate the item to schoolwork and read as follows: "There are many ways to cope with challenges. What do you do when you are experiencing academic challenges at school?" In the present study, the original four-step scoring format was changed to a six-step format (from 1 to 6) as follows: *strongly disagree, disagree, disagree a little, agree a little, agree, strongly agree*. A one-factor CFA with correlation of error terms for the items "*I make a plan of action*" and "*I try to come up with a strategy about what to do*" yielded a good fit. The need for correlating residuals may reflect that the terms used in the items "plan" and "strategy" indicate a stronger focus on the cognitive aspects of planning. The omega value was highly reliable at 0.91.

Students' ability to do homework effectively was assessed by a subscale derived from the Self-Regulation Strategy Inventory—Self-Report (SRSI-SR) (Cleary, 2006). Items measured strategies for doing homework, e.g., "*I make a schedule to help me organize my study time*." A six-step scoring format was used (from 1 to 6): *Strongly disagree, disagree, disagree a little, agree a little, agree, strongly agree*. A one-factor solution yielded a good fit for the five items with an omega value of 0.75.

2.4 Control variables

Studies have shown that students from economically disadvantaged backgrounds are at higher risk of experiencing ED than economically secure students (Reiss, 2013; Weinberg et al., 2019). Academic optimism has also been shown to vary by socioeconomic status (SES) in that economically disadvantaged students may have a lower perception of their AEB than more privileged students (Bolger et al., 1995). Furthermore, the involvement of parents in students' academic work has been shown to influence optimistic academic beliefs (Fan and Williams, 2010), and empirical results suggest that parents' involvement in students' schoolwork also tends to reduce ED (Wilkinson-Lee et al., 2011). Moreover, research indicates that students' academic achievement influences their motivation toward school (Maddux and Kleiman, 2018). Based on findings from earlier studies, self-reported SES, parents' academic support, and an indicator of academic performance were used as control variables for AEB and ED.

2.4.1 Socioeconomic status

Socioeconomic status was measured using one item assessing social inequality in adolescence derived from the Family Affluence Scale-II (Boyce et al., 2006). The item conceptualized home affluence and an economy based on a Norwegian prosperity standard: "*During the past 12 months, how many times did you travel on holiday with your family*?" using a four-step scoring format ranging from 0 to 3: *Not at all 0; Once 1; Twice 2; More than twice 3*. Item mean score was used as a control variable.

2.4.2 Parents' academic support

Parents' academic support was assessed using the composite of three items. The items capture various forms of parental educational support, e.g., "*My parents are interested in my schoolwork*," "*My parents help me with schoolwork when I ask them*

to," "*My parents often praise me for my efforts with schoolwork*." A five-step scoring format was used (from 1 to 5): *Strongly disagree, disagree, disagree a little, agree, strongly agree*. The scale was reliable with an omega value of 0.83.

2.4.3 Academic performance

Academic performance was measured using a composite score of results from the national test assessing eighth-grade students' performance in reading of Norwegian, math, and English. The omega value was 0.83.

3 Results

3.1 Preliminary analysis

The results of tests conducted on the measurement models in line with the recommendations of Jöreskog (1993) may be found in the overview of measurement models in "Appendix" A. All measurement models yielded a good fit. In testing for measurement invariance, scalar invariance was supported using the recommended criteria for invariant differences in CFI ≤ -0.010 and RMSEA ≥ 0.015 (Chen, 2007; Cheung and Rensvold, 2002). A detailed overview may be found in "Appendix" B.

The samples in this study were clustered at the class level. However, an inspection of intraclass correlation (ICC) for all variables showed low coefficients (ranging from 0.5 to 4%). The design-effect estimate was below 2.0. Type = complex analysis was applied. The structural model was run both with and without the complex to ascertain whether model fit and standard error were changed. The results did not convey any change in SE values or model fit, and the use of type = complex was excluded.

3.2 Primary analysis

Table 1 presents the inter-correlation, mean, and standard deviation among all study variables used to assess SEC, AEB, and ED for the overall sample. All correlations were significant and ranged from small to moderate in size (Cohen, 1988).

Table 2 displays bivariate intercorrelations, means, and standard deviations for the females and males separately. All correlations, except that between planning schoolwork and ED for females, were significant and ranged from small to moderate in size.

3.3 The structural latent path modeling

The latent path model for the overall sample yielded a good fit: X2 = 0.1645.07 (760); RMSEA: 0.032; 90% CI (0.030-0.034); CFI: 0.954; TLI: 0.950; SRMR: 0.039. In answering research question 1, structuring of homework was observed to have the strongest direct effect on AEB for the overall sample. A slightly weaker direct effect

Table 1 Intercorrelations mean and standard deviations for the study variables

	1	2	3	4	5	6
Emotional distress	–	–	–	–	–	–
Academic efficacy beliefs	− .34 **	-	–	–	–	–
Relationship skills	− .25**	.34**	–	–	–	–
Emotional regulation	− .19 **	.37**	.25**	–	–	–
Planning and structuring schoolwork	− .09**	.37**	.18**	.33**	–	–
Structuring of homework	− .15**	.38**	.21**	.29**	.37**	–
M (SD)	1.53 (0.57)	5.09 (0.74)	4.90 (0.98)	4.12 (1.09)	4.05 (1.24)	4.61 (0.83)

**$p < .01$

Table 2 Intercorrelations, mean, and standard deviation among the study variables for males and females, respectively

Scale	1	2	3	4	5	6
Emotional distress	–	− .35**	− .27**	− .27**	− .05	− .18**
Academic efficacy beliefs	− .29**	–	.30**	.39**	.35**	.41**
Relationship skills	− .16 **	.36**	–	.21**	.12**	.18**
Emotional regulation	− .13**	.35**	.30**	-	.36**	.27**
Planning schoolwork	− .11*	.37**	.23**	.32**	–	.37**
Structuring homework	− .12 **	.35**	.25**	.31**	.37**	–
M (SD) females	1.66 (.63)	5.00 (0.76)	4.78 (1.00)	4.12 (1.00)	3.95 (1.23)	4.59 (0.80)
M (SD) males	1.39 (.48)	5.18 (0.71)	5.03 (0.91)	4.12 (1.18)	4.15 (1.25)	4.62 (0.87)

Intercorrelations for the study variables among males ($n = 560$) are presented below the diagonal. Intercorrelations for the study variables among females ($n = 582$) are presented above the diagonal. **$p < .01$

was observed for the variables relationship skills and emotional regulation in the direct path of association with AEB. The weakest path of association appeared for the planning of schoolwork and AEB. The SEC variables explained 35% of the variation in AEB for the entire sample.

Following research question 2, results displayed that AEB had the strongest (negative) path of association with ED for the entire sample. For the other SEC variables, the model allowed for a direct path of association and indirect path of associations via AEB with ED. For the entire sample, relationship skills yielded the second strongest total association with ED. Emotional regulation had the third strongest path of association with ED for the entire sample. Planning of schoolwork and structuring of homework showed only very weak paths of association with ED. SEC variables accounted for 17% of the variance in ED among the entire sample.

3.3.1 Indirect effects

Regarding research question 2, relationship skills were significantly negatively and indirectly associated with ED ($\beta = -0.06$, $p < 0.001$). The same significant negative path of indirect effect was observed for emotional regulation and ED ($\beta = -0.06$, $p < 0.001$). Planning of schoolwork was significantly and indirectly negatively associated with ED ($\beta = -0.05$, $p < 0.001$), and the same was true for structuring of homework ($\beta = -0.07$, $p < 0.001$). The results indicate that students' ED tends to decrease indirectly through AEB per standard deviation increase in SEC.

3.3.2 Gender differences

Regarding research question 3, the moderating effects of gender were evident for the paths of emotional regulation [females (X2 = 4.5 (1), $p < 0.05$, B = 0.23)] vs. [males $p < 0.001$, B = 0.13] and structuring of homework with AEB [females (X2 = 4.4 (1), $p < 0.05$, B = 0.34)] versus [males $p < 0.001$, B = 0.20]. The paths were significantly stronger for females than for males. Moreover, moderation occurred in favor of females for the paths relationship skills [females (X2 = 8.8 (1), $p < 0.01$, B = −0.11)] vs. [males $p = 0.54$, B = −-0.01], emotional regulation [females (X2 = 11.9 (1), $p < 0.001$, B = −0.13)] vs. [males $p = 0.60$, B = −0.01], and structuring of homework [females (X2 = 5.3 (1), $p < 0.05$, B = −0.07)] vs. [males p = 0.44, B = 0.03] with ED. SECs with AEB accounted for 33% of the variance for males and 37% for females. SECs with ED accounted for 11% of the variance among males compared to 22% among females.

Note: Covariates are given in a standardized (β) metric for the entire sample.

4 Discussion

This study was conducted to investigate how perceived relationship skills, perceived emotional regulation abilities, and perceived ability to structure schoolwork were related to academic efficacy beliefs (AEB). Moreover, the ways in which these aspects of SEC were related to emotional distress (ED) were also examined. Finally, gender differences in these associations were explored. Findings related to the research questions will be discussed below (Fig. 1).

4.1 Associations with academic efficacy beliefs

This study's first research question concerns how the various SECs were associated with AEB. The strongest association with AEB occurred for structuring of homework. Planning of schoolwork yielded a relatively strong bivariate but a weak, multivariate association with AEB. However, taken together, findings for the two variables assessing perceived ability to structure schoolwork indicate that such an ability

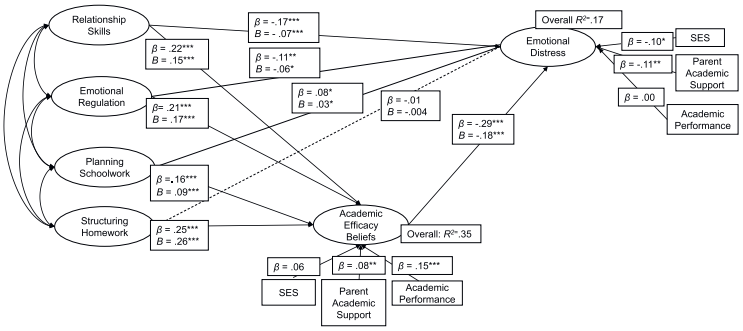

Fig. 1 Structural equation latent path modeling. Coefficients are given for the overall sample in standardized (β) and unstandardized metric (B) ($N = 1142$). *** = $p < .001$, ** = $p < .01$, * = $p < .05$

is linked to increased AEB. This corroborates findings from earlier studies indicating that students' self-management in school activities increases their AEB (Cook and Artino, 2016; Diseth et al., 2014).

The second most salient association was found for perceived relationship skills with AEB and may indicate that such skills increase the students' likelihood of getting support from their peers in school contexts and that this promotes AEB (Shin and Ryan, 2012). This corroborates earlier studies' findings that students' positive peer relationships influenced the probability that they would seek academic support, thereby increasing their AEB (Mikami et al., 2017; Putwain et al., 2013).

The third strongest association was for emotional regulation and AEB. These results are in line with recent empirical findings suggesting that the ability to reappraise situations in a way that generates more positive emotions relates to positive thoughts and actions concerning the ability to master schoolwork (Gross, 2015). Moreover, as suggested by Pekrun and Stephens (2012), positive academic emotions influence students' expectations of their future ability to master various school subjects. Hence, the ability to reappraise situations more positively may enhance students' beliefs about their ability to cope adequately in an academic context (Castella et al., 2013).

4.2 Associations with emotional distress

The second research question of this study concerned how the various SECs were associated with ED. A relatively strong tendency to experience less ED was observed in students with high AEB. These results suggest that educational achievements have become increasingly important and that individuals' beliefs in their ability to succeed protect them against ED (Deci and Ryan, 2008). Moreover, in the present study, AEB conceptually includes optimism and a growth mindset as aspects of self-awareness, known to be mechanisms that protect against ED (Durlak et al., 2011; Taylor et al., 2017).

Our results showed a moderately strong tendency for those perceiving themselves as having good relationship skills to report less ED. This result supports findings from earlier studies indicating that the ability to build positive relationships promotes mental health (Malecki and Elliot, 2002; Patrick et al., 2016). The ability to form positive peer relationships and to seek social support when needed increases the likelihood that an individual will fulfill their need for relatedness and protect themselves against ED (Niemiec and Ryan, 2009; Ryan and Deci, 2000). Despite earlier inconsistent findings regarding adolescents' ability to seek social support to reduce ED (Murberg and Bru, 2004b, 2009; Rueger et al., 2016), the present study's results may indicate that relationship skills matter in gaining social support as a strategy for the minimization of stressful experiences. Furthermore, the indirect negative path from relationship skills to ED may indicate that students seek social support regarding academic work and that this influences their belief in their ability to succeed academically, which in turn reduces ED. This finding further supports results from earlier studies (Blakemore et al., 2004; Chu et al., 2010).

Students' perceived ability to regulate emotions was also moderately linked to lower ED in the present study. The result is in accordance with the notion that ability to reappraise negative emotions more positively may help individuals to perceive stressful encounters from a more resilient perspective (Shapero et al., 2019). This also aligns with a recent study suggesting that positive reappraisals allowed for greater adaptability in emotional situations, and thereby counteracted experiences of ED (De France and Hollenstein, 2019). Moreover, the negative indirect associations through AEB may suggest that students' ability to adequately regulate the emotions that arise in relation to their academic lives leads to increased AEB, which then will function as a protection against ED (Weinstein and Ryan, 2011).

The two variables concerning structuring of schoolwork exhibited weak associations with ED, suggesting that these SECs may play only a minor role in ED.

4.3 Gender differences

The third research question in this study explored gender differences, which were evident in the strengths of several paths in the structural model, in favor of females. For ED in particular, independent variables accounted for greater variance among females. Perceived relationship skills were more strongly linked to less ED among females. This finding is in accordance with earlier studies indicating that females more actively seek social support to cope with stress (Eschenbeck et al., 2007; Kort-Butler, 2009). Moreover, female interactions, more than male interactions, are suggested to be close but also to be associated with anxiety about social exclusion and self-disclosure, factors that may increase ED (Rose and Rudolph, 2006; Rudolph and Conley, 2005). Taken together with this notion, the present study's results may indicate that females require functional relationship skills to prevent ED.

The path from emotional regulation to ED was also stronger for females than for males. This finding may suggest that, as females tend to experience more negative emotions, they will benefit from the ability to appraise situations in a way that engenders positive emotions (Chaplin and Aldao, 2013; Weisberg et al.,

2011). Furthermore, early adolescence is a period of emotional instability (Zimmermann and Iwanski, 2014), and it may be particularly important for adolescent females to have functional emotional regulation strategies to reduce ED. Earlier studies' findings that females implement more strategies of emotional regulation support this interpretation (Nolen-Hoeksema and Aldao, 2011). Our findings suggest that it may be especially beneficial to enhance adolescent females' competence in emotion regulation to prevent or reduce ED (Bender et al., 2012).

The association between emotional regulation and AEB was also stronger for females. Findings may reflect that adequate emotional regulation could contribute more to AEB among females. This aligns with previous findings indicating that positive academic emotions were more closely linked to a general optimism toward school among female students (Neumann et al., 2010). Furthermore, adolescent females tend to have lower AEB than male students (Diseth et al., 2014). This underscores the fact that efforts to help students regulate unpleasant academic emotions may be beneficial for adolescent female students.

Gender differences, although weak, were evident in the strengths of the paths from structuring homework to ED and AEB, respectively, in favor of females. Earlier studies indicated that females invest more in schoolwork and tend to perceive schoolwork as more stressful (Bru et al., 2019; Goldstein et al., 2015). The present study's findings suggest that structuring homework by managing time and behavior may help females to remain optimistic in the academic context and prevent ED. To test this assumption, further experimental research is required.

4.4 Methodical considerations

The present study's strength lies in the relatively large sample size. The measures' validity was ensured by using established measures and testing measurement models. Moreover, the reliability of the SEC variables' unique associations was strengthened by controlling for SES and parents' academic support. Additionally, access to students' national test results minimized the bias known to be present in students' self-reported grades, and advanced statistical methods contributed to statistical validity. Low ICCs and design effects did not imply a need for multilevel analysis, and the complex solution confirmed that clustering at the class level did not influence the results. The cross-sectional design has its limitations in that the exposure and outcome were assessed simultaneously, providing no evidence of a temporal or causal relationship between variables. Suggestions concerning the benefits of SECs should therefore be regarded as assumptions for further research. Moreover, this study included a limited number of SECs, and future studies should examine how other SECs are linked to AEB and ED in early adolescence. The present study collected data from students' self-report questionnaires, which may have influenced data and findings. Future research should expand the approach to incorporate other assessment methods, such as behavioral skills observations and informant observation, to gain more comprehensive insights into students' SECs.

4.5 Conclusions

Structural equation modelling highlighted that all the SECs we examined had a role in promoting AEB. This appeared to be particularly important for female students where perceived relationship skills, emotional regulation, and structuring of schoolwork were more strongly related to less ED. Similarly, emotional regulation and structuring of schoolwork were more strongly associated with AEB. These findings indicate that these SECs may be more important for the emotional well-being of female adolescent students.

Although we cannot establish causality, our results suggest that the ability to structure schoolwork, establish relationships at school and regulate emotions have a role in AEB and, via this, in the prevention or reduction of ED. The role of AEB in ED underscores the important role of schools in preventing ED among adolescence. Lower secondary schools should give priority to helping students develop relationship and emotional regulation skills.

Appendix A: Factor loadings and goodness-of-fit indices for all measurement models. Internal consistency for factor-based indexes is given in Cronbach's alpha and omega-values*.

Measurements models for SECs, AEB and ED						Factor loadings
Relationship skills	SRMR = 0.036	RMSEA = 0.13 90% CI (0.10-0.15)	CFI = 0.95	TLI = 0.89	α = 0.90	–
**Correlation of residuals*	SRMR = 0.013	RMSEA = 0.05, 90% CI (0.03-0.08)	CFI = 0.99	TLI = 0.98	ω = 0.91	–
Introduction: Below are some statements regarding how you interact with others. Select the option that suits you best						–
I get to know others easily						0.79
I get in touch with others quickly						0.84
I know how to take contact with others						0.86
I capture the interests of others in a positive way						0.75
I easily find something to talk to others about						0.76
Emotional Regulation	*SRMR* = 0.05	RMSEA = 0.14, 90% *CI* (0.12-0.16)	*CFI* = 0.91	*TLI* = 0.83	α = 0.88	–
* Correlation of residuals	*SRMR* = 0.012	*RMSEA* = 0.03 90% *CI* (0.00-0.06)	*CFI* = 0.99	*TLI* = 0.99	ω = 0.88	–
Introduction: Below are several statements about how you may handle your emotions. Think about how you regulate your feelings and mark the option that suits best						–
When I want to feel happier, I think about something else						0.61
When I want to feel less bad [e.g. sad, angry, or worried], I think about something else						0.67

Measurements models for SECs, AEB and ED						Factor loadings
When I am worried about something, I think about it in a way that helps me feel better						0.78
When I want to feel better in relation to something, I change the way I think about it						0.89
I control my feelings about things by changing the way I think						0.80
Planning of Schoolwork	SRMR = 0.03	RMSEA = 0.13 90% CI (0.11-0.16)	CFI = 0.95	TLI = 0.89	$\alpha = 0.91$	–
* Correlation of residuals	SRMR = 0.011	RMSEA = 0.05 90% CI (0.02-0.08)	CFI = 0.99	TLI = 0.99	$\omega = 0.91$	–
Instructions: There are many ways to cope with challenges. What do you do and feel when you are experiencing academic challenges at school?						–
I make a plan of action						0.76
I try to come up with a strategy about what to do						0.82
I think about how I might best handle the problem						0.82
I think hard about what steps to take						0.87
I have done what must be done step by step						0.77
Structuring homework	SRMR = 0.02	RMSEA = 0.05 90% CI (0.03-0.07)	CFI = 0.98	TLI = . 96	$\alpha = 0.75$ $\omega = 0.75$	–
Instructions: How do you set yourself up for success regarding homework?						–
I make sure no one disturbs me when I study						0.57
I make a schedule to help me organize my study time						0.64
I finish all of my studying before I play video games or visit my friends						0.57
I try to study in a quiet place						0.62
I think about how best to study before I begin studying						0.66
Academic efficacy beliefs	*SRMR* = 0.04	*RMSEA* = 0.06 90% *CI* (0.05-0.06)	*CFI* = 0.95	*TLI* = 0.94	$\alpha = 0.92$ $\omega = 0.83$	–
Instruction: Do you agree or disagree with the following statements about opportunities to learn and develop? Select the option that best suits you. There are no correct or incorrect answers						–
I can learn what they teach at school this year						0.62
I can figure out anything if I try hard enough						0.72
If I practice every day, I can become good at almost anything						0.69
When I have decided to accomplish something that is important to me, I keep trying to complete it, even if it is more difficult than I thought						0.74
I am certain that I will achieve the goals that I have set for myself						0.70
When I'm struggling to accomplish something difficult, I focus on the progress I make instead of feeling discouraged						0.67
I believe hard work pays off						0.70
My abilities grow based on the effort I make						0.82
I believe that the brain may be developed like a muscle						0.73
I think that regardless of who you are, you may make considerable changes to your abilities						0.74
I can change my capabilities significantly						0.76

Measurements models for SECs, AEB and ED						Factor loadings
Emotional distress	SRMR = 0.05	RMSEA = 0.08 90% CI (0.07-0.09)	CFI = 0.92	TLI = 0.90		–
*Correlation of residuals	SRMR = 0.037	RMSEA = 0.06 90% CI (0.05-0.07)	CFI = 0.95	TLI = 0.94	$\alpha = 0.90$ $\omega = 0.90$	–
Instruction: Below is a list of various worries. Have you experienced any of these worries in the last week (even today)?						–
Sudden fear for no reason						0.61
Feeling scared or anxious						0.64
Fatigue or dizziness						0.58
Feeling tense or anxious						0.64
Easy to blame yourself						0.75
Sleep problems						0.57
Depressed, heavy-hearted (sad)						0.81
Feeling of being useless, little worthwhile						0.79
Feeling everything is an effort						0.76
Sensation of hopelessness with regard to the future						0.75
Measurement model for the dependent variables emotional distress and AEB	SRMR = 0.05	RMSEA = 0.05 90% CI (0.04–05)	CFI = 0.94	TLI = 0.93	$X^2 = 695.3$ (187), $p < 0.001$	–
Measurement model for the independent variables—relationship skills, emotional regulation, planning of schoolwork and structuring of homework	SRMR = 0.03	RMSEA = 0.02 90% CI (0.02–0.03)	CFI = 0.99	TLI = 0.99	$X^2 = 259.2$ (161), $p < 0.001$	–

Measurements models for SECs, AEB and ED						Factor loadings
The overall measurement model	SRMR = 0.04	RMSEA = 0.03 90% CI (0.03–0.04)	CFI = 0.95	TLI = 0.95	$X^2 = 1645$ (760), $p < 0.001$	–

*Internal consistency is given in both Cronbach's alpha and omega because of the non-unidimensionality of some scales. Alpha values are expected to overestimate the reliability in cases where error variances are allowed to correlate. Omega and alpha will yield the same results if alpha is not violated by the data.

Appendix B: Measurement invariance across gender following the guidelines of Chen, 2007, *RMSEA* = ≥ 015, *CFI* = ≤ −0.010 for configural, metric, and scalar models in the study.

Measurement models:	X^2	*df*	Number of free parameters	*p*-value	*RMSEA* 90% *CI*	*CFI*	*TLI*	*SRMR*
Relationship skills								
Model males	6.24	4	–	0.18	0.03 (0.00–0.07)	1	0.99	0.01
Model females	10.43	4	–	0.05	0.05 (0.01–0.09)	0.99	0.98	0.01
Configural	16.34	8	32	0.001	0.04 (0.01–0.07)	1	0.99	0.01
Metric	25.64	12	28	0.001	0.05 (0.02–0.07)	0.99	0.99	0.06
Scalar	45.62	16	24	0.001	0.06 (0.04–0.08)	0.98	0.98	0.08
Planning schoolwork								
Model males	13.46	4	–	0.05	0.07 (0.03–0.11)	0.99	0.97	0.02
Model females	14.60	4	–	0.05	0.07 (0.03–0.11)	0.99	0.97	0.01
Configural	27.97	8	32	0.001	0.07 (0.04–0.09)	0.99	0.97	0.02
Metric	36.65	12	28	0.001	0.06 (0.04–0.08)	0.99	0.98	0.03
Scalar	46.66	16	24	0.001	0.06 (0.03–0.08)	0.98	0.98	0.04
Structuring homework								
Model males	16.53	5	–	0.05	0.06 (0.03–1.00)	0.97	0.94	0.03
Model females	6.66	5	–	0.25	0.02 (0.00–0.07)	1.00	0.99	0.02
Configural	23.41	10	66	0.05	0.05 (0.02–0.07)	0.98	0.97	0.02
Metric	28.26	14	56	0.05	0.04 (0.02–0.07)	0.98	0.97	0.04
Scalar	36.75	18	46	0.05	0.04 (0.02–0.06)	0.98	0.97	0.05
Emotional regulation								
Model males	2.32	4	–	0.68	0.00 (0.00–0.05	1.00	1.00	0.01
Model females	9.06	4	–	0.06	0.05 (0.00–0.09)	0.99	0.98	0.02
Configural	11.1	8	32	0.20	0.03 (0.00–0.06)	1.00	0.99	0.02
Metric	18.48	12	28	0.11	0.03 (0.00–0.06)	1.00	0.99	0.05
Scalar	29.42	16	24	0.02	0.04 (0.02–0.06)	0.99	0.99	0.06

Measurement models:	X^2	*df*	Number of free parameters	*p*-value	*RMSEA* 90% *CI*	*CFI*	*TLI*	*SRMR*
Academic efficacy beliefs								
Model males	133.47	44	–	0.001	0.06 (0.05–0.07)	0.94	0.93	0.04
Model females	199.113	44	–	0.001	0.08 (0.07–0.09)	0.93	0.91	0.04
Configural	325.79	88	30	0.001	0.07 (0.06–0.08)	0.94	0.92	0.04
Metric	348.18	98	26	0.001	0.07 (0.06–0.08)	0.93	0.92	0.06
Scalar	378.99	108	22	0.001	0.07 (0.06–0.07)	0.93	0.93	0.07
Emotional distress								
Model males	71.08	34	–	0.001	0.05 (0.03–0.06	0.97	0.96	0.03
Model females	154.55	34	–	0.001	0.08 (0.07–0.09)	0.94	0.92	0.04
Configural	218.67	68	62	0.001	0.06 (0.05–07)	0.95	0.93	0.04
Metric	224.45	77	53	0.001	0.06 (0.05–0.07)	0.95	0.94	0.04
Scalar	249.32	86	44	0.001	0.06 (0.05–0.07)	0.95	0.94	0.05
Invariance of the overall measurement model								
Configural	2563.23	1520	284	0.001	0.04 (0.03-0.04)	0.95	0.94	0.05
Metric	2618.32	1555	249	0.001	0.04 (0.03-0.04)	0.95	0.94	0.05
Scalar	2718.63	1590	214	0.001	0.04 (0.03-0.04)	0.94	0.94	0.05

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Declarations

Conflicts of interest The authors declare that they have no conflict of interest.

Ethics approval To ensure that the present study adheres to the proper guidelines for the protection of human subjects, the study was formally approved by the Norwegian Social Science Data Services (NSD).

Consent to participate Only students with written consent from parents or guardians were allowed to participate in the study.

Consent for publication All participant had a signed consent from parents or guardian allowing for publication of data.

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Study II

Vestad, L., Bru, E., Virtanen, T. (In revision). Changes in academic efficacy beliefs in the first year of lower secondary School. Is it related to changes in social and emotional competencies? *Educational Psychology. An International Journal of Experimental Educational Psychology.*

Changes in Academic Efficacy Beliefs in the First Year of Lower Secondary School. Is it Related to Changes in Social and Emotional Competencies?

Abstract

This longitudinal study investigated intra-individual changes in relationship skills, emotional regulation, perceived classroom relations, and academic efficacy beliefs (AEB) during the first year of lower secondary school. Both the level of change and the links between changes were studied in a sample of 1142 students. Structural equation modeling (SEM) and a latent change score approach were applied. Our findings suggest that 1) social and emotional competencies (SECs), classroom relations, and AEB all decrease on average during the first year of lower secondary school; 2) a strong positive direct association exists between developments in emotional regulation and AEB; and 3) changes in relationship skills were positively linked to changes in collaborative peer relations and emotional support from teachers and—indirectly via these changes—with AEB. Our results support the importance of enhancing relationship skills and emotional regulation to promote supportive classroom relations and AEB.

Keywords: Social and emotional competencies, emotional support from teachers, collaborative peer relations, academic efficacy beliefs, lower secondary school

CHANGES IN SOCIAL AND EMOTIONAL COMPETENCIES

Introduction

Students' academic efficacy beliefs (AEB) regarding their schoolwork are crucial for their optimism and well-being as well as their performance and achievement in school (Dweck, 2007; Schunk & Meece, 2006). However, entry into lower secondary school may present both academic and social challenges to students, as demands from schoolwork intensify and evaluations become more normative. For many students, increased demands and evaluations may negatively alter their AEB. Moreover, starting in lower secondary school also requires students to establish academically supportive relationships with new teachers. As new school classes are formed, students may also find it difficult to establish supportive peer relationships (Wang & Dishion, 2012). Students' social and emotional competencies (SECs), such as the ability to regulate emotions and establish supportive relationships, and the positive development of these skills are therefore likely to be crucial in transitioning to secondary school. Existing research and knowledge regarding brain development indicate that adolescence is a period of substantial development with respect to emotional regulation and relationship skills (Steinberg, 2005). To our knowledge, no research to date has examined how intra-individual changes in these competencies relate to changes in students' perceived emotional support from teachers, collaborative peer relations, and AEB during the first year of lower secondary school. The present study uses latent change score modeling to represent intra-individual changes (Geiser et al., 2019). Knowledge of developmental changes may offer insights into how supportive academic relations and AEB may be improved by stimulating relationship skills and emotional regulation among second-level students.

Theoretical Framework

This study adopts a theoretical approach that assumes that intra-individual changes in students' perceived relationship skills influence changes in their perceived emotional support

from teachers and collaborative peer relations, which in turn is believed to influence individual changes in AEB. Moreover, it assumes that emotions and behavior affect the perceived emotional support from teachers and peer collaboration (Bell & Song, 2005). The model therefore proposes that intra-individual changes in emotional regulation influence changes in AEB both directly and indirectly through changes in students' perceived relationships in the classroom.

Academic Efficacy Beliefs

AEB encompass student motivation and engagement, which in the present study are conceptualized as a combination of general academic self-efficacy (Pajares, 2001) and growth mindset (Dweck & Sorich, 1999). AEB thus reflect academic mastery expectancies across educational domains rooted in past experiences and in the belief that ability develops through effort and perseverance (Yeager & Dweck, 2012). A previous test of a measurement developed based on this theoretical approach to AEB suggests that both theories reflect a single latent concept (Vestad et al., 2021).

The Significance of AEB in Adolescence

AEB is expected to play a role in students' educational lives and to govern effort and persistence regarding schoolwork (Wigfield et al., 2015). Thus, AEB is considered essential for facilitating motivation and learning and for students' academic achievement and performance (Honicke & Broadbent, 2016). Earlier research linked adequate AEB to students' engagement in deep learning processes (Yeager & Dweck, 2012) and to higher academic achievement (Brougham & Kashubeck-West, 2017).

In lower secondary school, students encounter greater academic demands and have increased responsibility for their learning (Eccles et al., 1993). In Norway, students get grades for the first time when they start in lower secondary school and this may facilitate comparison about academic achievements, intensifying social comparison among peers

(Skaalvik & Federici, 2015). For some students this may lead to a more pessimistic view of their academic capabilities or diminished AEB (Schunk & Meece, 2006). Accordingly, academic motivation has been shown to decline in secondary school (Gottfried et al., 2001), and AEB is expected to decrease correspondingly.

Classroom Relations and AEB

Perceived emotional support from teachers encompasses students' trust in their teachers and their valuation of the relationship as warm and supportive (Pianta et al., 2012). It also involves teachers' encouragement of their students' academic efforts (Özdemir, 2020). High-quality emotional support from teachers is shown to be crucial for students' perceptions of their academic competence (Ruzek et al., 2016). This is substantiated by the notion that qualitative and supportive student-teacher relationships foster students' beliefs about their academic ability, thereby enhancing their motivational beliefs (Bru et al., 2002). Upon entering lower secondary school, students must establish new relationships with multiple teachers. This may make the establishment of supportive relationships more challenging, and students' perceived emotional support from their teachers is lower at secondary than at primary level (Bru et al., 2010). Based on the above, perceived emotional support from teachers on average is expected to decrease during the first year of lower secondary school, followed by a decline in AEB.

Collaborative peer relations involve students' perceived competence to help and share academic knowledge with their peers (Fernandez-Rio et al., 2017). Functional peer collaboration is also linked to increased academic support (Furrer et al., 2014) and could thereby enhance students' optimism toward schoolwork (Skinner, 2016). Supportive peer relations in the learning environment are also linked to higher AEB (Kulakow & Raufelder, 2020). However, secondary-level educational structures typically offer fewer opportunities for peer collaboration regarding academic subjects (Engels et al., 2017). Difficulties in

establishing new and supportive relationships may contribute to reductions in AEB (Gnambs & Hanfstingl, 2016). Changes in peer relationships have also been shown to negatively affect the adequacy of collaborative relations (Heinsch et al., 2019). It is thus expected that students' perceived collaborative relationships with their peers on average will decline during the first year of lower secondary school and that such changes contribute to the expected diminishment of AEB.

Developmental Changes in Relationship Skills and Emotional Regulation in Adolescence

Brain maturation, cognitive development, and enhanced understanding of emotions in adolescence are likely to lead to enhanced capacity for emotional regulation, both generally and academically (Herd et al., 2020). Similar developmental changes may improve relationship skills. Ross et al. (2019) observed improvements in relationship skills between ages 10 and 15 but a downward tendency for relationship quality during the same period. They also found substantial individual variations at different measurement time points, suggesting that development of these skills varies between individuals. Self-appraisal skills also improve with cognitive development. Younger children are often overconfident regarding their competencies (Schunk & Pajares, 2002); in adolescence, a more realistic self-appraisal may emerge and influence perceived competencies. Moving into the new context of lower secondary school could bring corrections to perceptions of relationship skills as well as the ability to regulate emotions. This may lead to a downward trend and greater variation in perceived relationship skills and emotional regulation. However, the scant existing research obstructs the crystallization of clear expectations regarding the direction of the overall change, but implies that intra-individual changes occur in relationship skills and emotional regulation within the first year of secondary school.

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Changes in Students' SECs and Classroom Relations

In school, students' perceived relationship skills concern the ability to interact adequately with others (Eckenrode, 2013). Relationship skills are essential to establishing social relationships, and when perceived as successful, they enable students to feel emotionally supported by their teacher in their learning (Pianta et al., 2012). Thus, students use their relationship skills to seek support in learning situations wherein the teacher responds with constructive feedback (Martela & Ryan, 2016). It is therefore anticipated that changes in relationship skills will be associated with changes in emotional support from teachers.

Students' perceived relationship skills may also influence their collaborative peer relationships. Adequate relationship skills have been linked to enhanced qualitative feedback processes among the students using responsive communication in learning situations (Zhang et al., 2020). This may provide more positive social interactions that advance students' ongoing peer collaboration (Van Ryzin et al., 2020). On the other hand, as peer collaboration is more socially demanding in secondary school (Wang & Dishion, 2012), it is likely that students' perceived relationship skills are challenged during this period. Hence, it is assumed that changes in students' perceived relationship skills will be positively associated with changes in their collaborative peer relations.

Emotional regulation concerns the ability to adequately interpret emotionally activated situations (Gross, 2014). Students who perceive themselves as capable of regulating their emotions also perceive their teachers as emotionally responsive and supportive in learning situations (Pitzer & Skinner, 2017). Adequate emotional regulation facilitates student-teacher interactions that are characterized by warmth and support (Pekrun et al., 2007). By contrast, students may also experience educational situations in which they are less able to regulate their emotions, which may result in negative emotions affecting their behavior in learning activities (Eisenberg et al., 2010) and increased conflict with their

teachers (Tsouloupas et al., 2010). This leads to the assumption that changes in perceived emotional support from teachers will follow changes in student's perceived emotional regulation.

Emotional regulation has also been found to be associated with constructive collaborative peer relations (Camacho-Morles et al., 2019); it involves sharing thoughts and reflections about learning, which is known to strengthen peer collaboration (Kwon et al., 2014). Potential increments in emotional regulation are believed to be associated with better collaborative learning relationships with peers in class.

The Present Study

As argued above, relationship skills are believed to be an important factor in establishing supportive relations with teachers and peers at school and to enhance expectations and motivation toward school (Scales et al., 2020). It is anticipated that improved relationship skills will be indirectly associated with positive developments in AEB through enhanced classroom relationships.

Emotion regulation may also have a similar indirect link to AEB. However, emotional regulation skills may also influence AEB directly by the regulation of academic emotions (Pekrun & Linnenbrink-Garcia, 2012). The ability to regulate emotions by appraising academic situations positively is key in facilitating more optimistic emotions that might enhance students' beliefs in their ability to master challenging academic tasks. In accordance with Pekrun's control-value theory, the ability to reduce negative academic emotions when facing challenging learning tasks could facilitate AEB and academic effort (see e.g Pekrun, 2016). Thus, emotional regulation might increase during the first year of lower secondary school and may be associated with a more positive individual development of AEB.

The present study's main aim, therefore, is to investigate how intra-individual changes develop during the first year of secondary school and how such changes in SECs' relationship

skills and emotional regulation may relate to intra-individual changes in students' perceived emotional support from teachers and collaborative peer relations with AEB. Changes in teacher and peer relations were treated as intermediate variables. Latent change scores in structural equation modeling (Geiser et al., 2019) were used to study the proposed model. Based on the above, this study addresses three research questions:

I. How do relationships skills, emotional regulation, emotional support from teachers, collaborative peer relations, and AEB change during the first year of lower secondary school?

II. How are intra-individual changes in perceived relationship skills and emotional regulation related to intra-individual changes in AEB?

III. To what degree are these associations mediated by intra-individual changes in collaborative peer relations and emotional support from teachers at school?

Methods

Participants and Procedure

A total of 1205 students from 54 eighth-grade classes within 11 lower secondary schools in a municipality in the east of Norway participated in this two-wave longitudinal study. The study is part of a larger longitudinal research project following the ethical standards of the Norwegian Data Protection Authority and approved in 2018 by the Norwegian Centre for Research Data.

The first assessment took place in September 2018 at the beginning of eighth grade (age 12-13). In total, 1147 (95%) students completed the survey. Five cases were omitted for poor response quality, and the remaining 99.5% (N = 1142) of the sample were retained (5% female). At the second time point, in March 2019 at the end of eighth grade (age 13–14), 91% of the total sample (N = 1094) completed the assessment (51.6% females). However, 53 cases

were omitted for poor response quality. The final respondent rate at the second time point was 86.5% (N = 1041) of the total sample.

At both time points, students completed an identical digital assessment during one school hour in the teacher's presence in the classroom. Before the assessment, all attending students consented orally to participation, and their parents or guardians also gave written consent on their behalf.

Measures

The assessments for the two time points were identical, and all items were scored on a six-point Likert scale ranging from 1–6 (*I strongly disagree* to *I strongly agree*).

Academic Efficacy Beliefs

Academic efficacy beliefs concern students' beliefs about their ability to accomplish challenging tasks, how this ability grows with effort (e.g., '*I can figure out anything if I try hard enough*'), and their ability to undertake academic challenges (e.g., '*When I have decided to accomplish something that's important to me, I keep trying to complete it, even if it is more difficult than I thought*') (Gaumer Erickson et al., 2016). Two items from the original 13-item scale were omitted because the wording was inapplicable to the Norwegian context. Scale reliability was high at both time points (T1; ω = .92 and T2; ω = .96).

Perceived Emotional Support from Teachers

The five-item scale on *students'* perceived emotional support from the teachers (Bru et al., 2002) assesses students' perceptions how their teachers emotionally support their learning: '*I can trust my teachers', 'My teachers will always help me if I have problems', 'I feel my teachers believe in me', 'I feel my teachers care about me', 'I feel that the teachers appreciate me'.* (T1; ω=92, T2; ω=.95).

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Collaborative Peer Relations

A five-item scale assessing students' perceived collaborative peer relations in an academic context was developed. The scale has five items and captures students' perceived ability to collaborate with peers: '*I collaborate with fellow students to understand the lesson'*, '*I help other students to understand the lesson', 'I encourage my fellow students to make an effort when struggling with schoolwork', 'My fellow students help me understand the learning materials', 'My fellow students encourage me to try when I struggle with schoolwork'*. (T1; ω=.89, T2; ω=.93).

Relationship Skills

The five-item relationship skills scale (Vestad et al., 2021) assessed students' perceived ability to establish relationships with others: '*I get to know others easily*', '*I get in touch with others quickly*', '*I know how to make contact with others*', '*I capture the interests of others in a positive way*', '*I easily find something to talk to others about*'. (T1; ω=.91, T2; ω=.93).

Emotional Regulation

The five-item *Reappraisal* subscale from The Emotion regulation Questionnaire for Children and Adolescents (ERQ–CA) (Gullone & Taffe, 2012) was used to measure students' reappraisal of emotionally charged situations through emotional regulation (e.g., '*When I want to feel happier, I think about something else*, *I control my feelings about things by changing the way I think*') (T1; ω=.88, T2; ω=.94).

Controlling for Academic Achievement and Gender

Research suggests that students' academic achievement is correlated with academic self-efficacy (Schunk & Pajares, 2002), peer relationships in the classroom (Gallardo et al., 2016), and perceived emotional support from teachers (Sointu et al., 2017).

Findings regarding gender differences in AEB are inconsistent (Spinath et al., 2014). Some research indicates that adolescent females are more successful than males in establishing supportive relationships with classmates and teachers (Brass et al., 2019). Therefore, we included students' grade point averages (GPA) and genders as covariates in relation to emotional support from teachers, collaborative peer relationships, and AEB. GPA from school registers was measured by students' grades in Norwegian, math, and English in the autumn semester of 2018, at the beginning of lower secondary school. Grades in the Norwegian school system range from one (lowest) to six (highest). The mean GPA was 3.89 with a standard deviation of .80.

The variable indicating gender had a value of 1 for males and 2 for females. During the school year, students were divided into two groups that experienced slightly different approaches to social and emotional learning. Therefore, group belonging was also included as a control variable with the values 1 and 2, respectively.

Statistical Procedure

The latent change score model (LCS; Steyer et al., 2000) method estimates error-free change scores, thus capturing true change from time point 1 (T1) to time point 2 (T2). Therefore, LCS was considered an optimal method for examining intra-individual longitudinal changes. In modeling LCS, the latent variable for the second time point is perfectly regressed on the latent variable of the first time point as well as the latent change variable with a residual of zero in the equation (see Figures 1 and 2).

The analyses were conducted as follows. First, means and standard deviations were examined, and bivariate correlations based on the saved latent mean change scores were checked (Tables 1 and 2). Second, longitudinal measurement models were estimated (see Appendix for fit indices). For well-fitting models, the following criteria were used (Hu & Bentler, 1998): standardized root mean squared residual (*SRMR*) close to .08, accompanied

by the Tucker-Lewis Index (*TLI*) (Tucker & Lewis, 1973) and the comparative fit index (*CFI*), with cut-off values close to .95. Additionally, the root-mean square error of approximation (*RMSEA*) was calculated with a cut-off value of .06 or less indicating a good fit and .08 indicating an acceptable fit, supplemented by a 90% confidence interval (*CI*). Third, scalar factorial time measurement invariance of the constructs was tested. The constrained models with equal factor loadings (metric invariance) and intercepts (scalar invariance) across the two time points were compared to freely estimated unconstrained models. The Cheung and Rensvold (2002) criterion of establishing longitudinal invariance with a change in CFI values < .010 was used (see Appendix for the results of testing measurement invariance).

Fourth, univariate LCS models were estimated to answer research question one (How do relationships skills, emotional regulation, emotional support from teachers, collaborative peer relationships, and AEB change during the first year of lower secondary school?) (see table 3). Two structural LCS models were estimated, with changes in SECs as predictors and change in AEB as an outcome. Changes in students' perceived emotional support from teachers were treated as an intermediate variable in model 1 and collaborative peer relations in model 2 to answer research question two—how changes in the SECs are related to AEB—and research question three—whether changes in classroom relations mediated these relations. Two separate models were estimated owing to the relatively high correlation between these intermediate variables and the fact that they accounted for variance in AEB. Additionally, the two structural models were estimated to mitigate the risk of a type II error. To prevent indicator specificity and model misspecification, indicator-specific method factors (Geiser et al., 2019) were included in the model.

The statistical program M*plus* 8.3 was used for the analysis with a robust maximum likelihood estimation. Indirect effects were investigated following MacKinnon et al.'s

recommendations (2004) using a bias-corrected bootstrap procedure to estimate 95% confidence intervals (*CI*).

Because some variables were not normally distributed, parameters were estimated using a robust maximum likelihood estimator (Chou & Bentler, 1995). Intraclass correlations (ICC) showed a small amount of classroom-level dependency of observations (.01–.05), and design effects ranged between 1.2 and 1.9 for the study variables.

Missing Data Analysis

The frequency of missing data ranged from 8 to 11%. The probability that missing data are directly related to variables was increased by the multivariate model and the inclusion of auxiliary variables (SES, school absence, wellbeing, and behavioral engagement). Therefore, missing at random (MAR, i.e., unobserved values were missing at random) was assumed. Full information maximum likelihood (FIML) was employed by estimating the likelihood function for each individual so that all available data were used (Muthén & Muthén, 1998).

Results

Preliminary analysis

Descriptive Statistics for T1 and T2

An overview of mean values for time points one and two and standard deviations are presented in Table 1. Bivariate correlations of saved LCS scores are presented in Table 2. Factor score (FS) determinacy reflects the value of the saved scores ranging from 0 to 1 with higher values indicating better measurement of the factor by the observed indicators. The bivariate correlation matrix based on raw scores may be found in the supplementary materials.

Table 1

Means and standard deviation for study variables. The scoring ranges for all study variables were between 1 and 6.

	Mean (SD)	Skewness	Kurtosis
AEB T1	5.10 (.722)	-1.25	2.65
AEB T2	4.79 (1.06)	-1.32	2.19
Emotional support from teachers T1	5.31 (.754)	-2.08	7.33
Emotional support from teachers T2	4.81 (1.06)	-1.44	2.43
Collaborative peer relations T1	5.07 (.824)	-1.42	3.35
Collaborative peer relations T2	4.74 (1.04)	-1.18	1.76
Relationship skills T1	4.90 (.97)	-1.27	1.88
Relationship skills T2	4.68 (1.11)	-1.02	.97
Emotional regulation T1	4.12 (1.09)	-.63	.42
Emotional regulation T2	3.90 (1.30)	-.37	-.30

Table 2

Bivariate correlation of the saved LCS and factor determinacy

	ΔCorrelation					
	1	2	3	4	5	Factor determinacy
1. ΔAEB	-					.96
2. ΔEmotional support from teachers	.27**	-				.98
3. ΔCollaborative peer relations	.29**	.46**	-			.94

4. ΔRelationship skills	.25**	.25**	.41**	-		.94
5. ΔEmotional regulation	.35**	.18**	.17**	.11**	-	.94

Note ** p <.01. The delta correlations are based on saved LCS from the univariate LCS models presented in Table 3.

Bivariate Δcorrelations for study variables were all moderate to strong. The strongest correlation was between ΔTeacher emotional support and ΔCollaborative peer relations; the weakest was for ΔEmotional regulation and ΔRelationship skills.

Measurement Models

The longitudinal measurement model results are presented in Appendix. All models had a good fit with high factor loadings for both time points: AEB (T1) .68–.82, (T2) .73–.90, emotional support from teachers (T1) .70–.90, (T2) .82–.95, collaborative peer relations (T1) .72–.84, (T2) .83–.90, relationship skills (T1) .69–.92, (T2) .90–.89. The measurement model for relationship skills yielded good fit after the second time point error terms were included for the first and second items '*I get to know others easily*' and '*I get in touch with others quickly*', indicating that, in addition to reflecting the latent construct, the item measures how quickly individual students establish contact with others. For emotional regulation, the factor loadings ranged (T1) .67–.86, (T2) .76–.94. Owing to the similar wording for the two first items '*When I want to feel happier, I think about something else*, *I control my feelings about things by changing the way I think*', the measurement model at the second time point allowed for correlation of residuals in line with an earlier study with a similar age group (Gullone & Taffe, 2012).

Univariate LCS Models

The latent change mean and variance of univariate models are presented in table 3. In line with the first research question regarding change across the first year of secondary school, the results indicated that a decrease occurred from the beginning to the end of eighth

grade. The highest negative change score was computed for perceived emotional support from teachers, while the lowest was found for emotional regulation and relationship skills, respectively. Significant variance was observed for all change scores, suggesting substantial variance in change between individual students across the two time points. The highest variation was found for emotional regulation and relationship skills.

Table 3

Average latent change, and variance for the univariate models of study variables

	Univariate latent change score models						
	χ^2 (*df*)	*RMSEA* (90% *CI*)	*CFI*	*TLI*	*SRMR*	Mean LCS M_{Δ}	Variance LCS s^2
1.AEB	956 (218)	.05 (.05-.06)	.93	.93	.05	-.29	.84
2. Emotional support from teachers	147.1 (39)	.05 (.05-.06)	.98	.98	.06	-.43	.84
3. Collaborative peer relations	239.5 (38)	.07 (.06-.08)	.95	.94	.06	-.33	.81
4. Relationship skills	292.8 (38)	.08 (.07-.08)	.94	.93	.05	-.21	1.01
5. Emotional regulation	211.3 (37)	.06 (.06-.07)	.96	.95	.04	-.19	1.25

LCS in Structural Equation Modeling

To address the second and third research questions about how ΔRelationship skills and ΔEmotional regulation relate to ΔAEB as well as the role of ΔClassroom relations as

mediators, two structural models with ΔEmotional support from teachers and ΔCollaborative peer relations as intermediate variables, respectively, were estimated (see Figures 1 and 2). Gender, grades, and grouping regarding the different approaches to social and emotional learning were included as covariates in both models. The structural LCS model's fit with ΔStudents' perceived emotional support as an intermediate variable was acceptable; $\chi 2$ = 3889.8 (1424), *RMSEA*: .04 (90%*CI*: .04–.04), *CFI*: .93, *TLI*: .93, *SRMR*:.05. Fit indices for the model with ΔStudents' perceived collaborative peer relations as an intermediate variable were also acceptable: $\chi 2$ = 4188.4 (1424), *RMSEA*: .04 (90%*CI*: .04–.04), *CFI*: .92, *TLI*: .92, *SRMR*: .05.

The explained variance of the indicator-specific effects (method factors) for study variables in the two structural models ranged 4–18% for AEB, 1–7% for perceived emotional support from teachers, 1–12% for collaborative peer relations, 1–15% for relationship skills, and 1–5% for emotional regulation. These results indicated that at most 18% of the study variables' variability was due to indicator-specific effects, suggesting that the observed measures were somewhat homogenous and captured the same construct over the two time points for the latent variables.

As Figures 1 and 2 illustrate, all coefficients were significant. Regarding the second research question—whether the SECs, ΔRelationship skills, and ΔEmotional regulation were related to ΔAEB—ΔRelationship skills were linked weakly and positively to ΔAEB. ΔEmotional regulation showed a stronger positive relationship to ΔAEB.

In the first model (Figure 1), ΔRelationship skills were directly associated with ΔEmotional support from teachers. The same results were obtained for ΔEmotional regulation and ΔEmotional support from teachers. ΔEmotional support from teachers was also related to ΔAEB. In sum, ΔRelationship skills and ΔEmotional regulation accounted for 12% of the

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In the second model, ΔRelationship skills showed a strong link to ΔCollaborative peer relations. ΔEmotional regulation was also directly associated with ΔCollaborative peer relations. ΔCollaborative peer relations were also directly related to ΔAEB. ΔRelationship skills and ΔEmotional regulation accounted for 26% of the variance in ΔCollaborative peer relations.

For the two models, the SECs, ΔEmotional support from teachers, and ΔCollaborative peer relations accounted for 25% of the explained variance in ΔAEB.

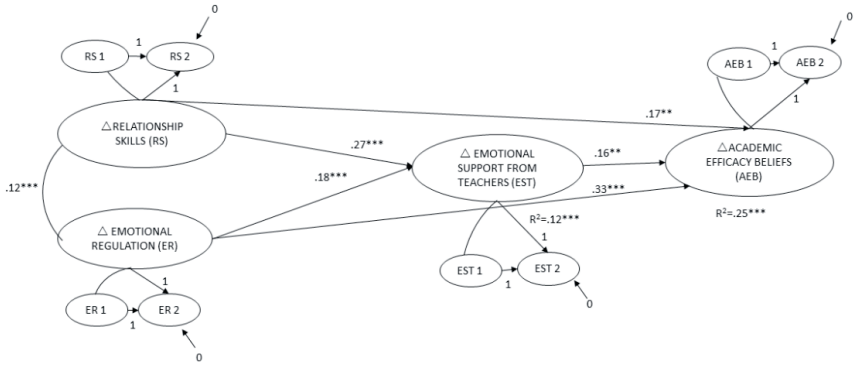

Figure 1

*Model 1: Structural equation modelling with students' ΔPerceived emotional support from teachers as an intermediate variable. For simplicity, some features are not visualized (correlations, means, intercepts, and factor loadings); *p<.05, **p <.01, ***p <.001.*

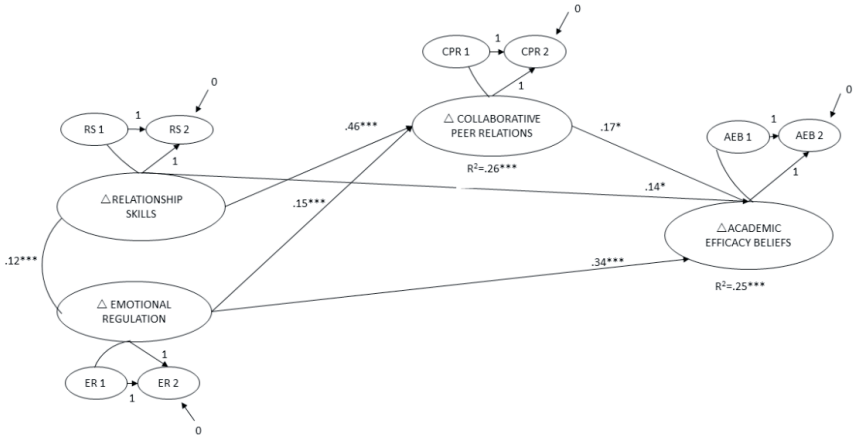

Figure 2

Model 2: Structural equation modelling with ΔStudents' perceived collaborative relations as an intermediate variable.

Indirect Effects

Regarding the third research question, the first model showed weak yet significant indirect effects for ΔRelationship skills and ΔAEB through ΔPerceived emotional support from teachers: β = .04, p = .002 (95%*CI* =.01–.09), and for ΔEmotional regulation via ΔTeacher emotional support β = .02, p = .004 (95%*CI*= .00–.05). Results for the second model of ΔRelationship skills through ΔPeer collaborative relations with ΔAEB showed the strongest indirect effect: β = .08, p = .002 (95%*CI*= .01–.15). For ΔEmotional regulation and ΔAEB via ΔPeer collaborative relations the indirect effects was weaker: β = .03, p = .01 (95% *CI*= .00–.06).

Discussion

This study assessed the latent true intra-individual changes in academic efficacy beliefs (AEB), classroom relationships, SECs, relationship skills, and emotional regulation during the first year of lower secondary school. The main aim was to investigate the links

between intra-individual changes for these variables. Two structural models were specified so that changes in the SECs predicted changes in AEB. Changes in students' perceived emotional support from teachers and collaborative peer relations were treated as intermediate variables in both models.

Change in the First Year of Lower Secondary School

Concerning the intra-individual changes in AEB, classroom relations, relationship skills, and emotional regulation during the first year of lower secondary school, an average decline was observed for all variables. The strongest decline was for students' perceived emotional support from teachers and collaborative peer relationships. Classroom relationships are essential for students to learn and thrive (Ruzek et al., 2019). The findings may support the stage-environment fit theory that a mismatch between students' needs, new social structures, and educational requirements in secondary school affects students' perceptions of social relations for educational purposes (Eccles, 2004). Hence, the findings are consistent with earlier research suggesting a decline in the students' perceived quality of interactions with teachers and peers at school during this period (Bru et al., 2010).

The average decline in AEB suggests that beliefs regarding one's academic ability generally decrease at secondary level (Wang et al., 2017), perhaps due to increased social comparison among peers. In Norway, students are introduced to grades for the first time when they enter lower secondary school and this may contribute to a refined or adjusted self-perception of the potential for academic achievement, which may diminish students' confidence in school (West et al., 2020). The average decline in perceived relationship skills may suggest that establishing new relationships requires more complex and sophisticated relational skills (Brown & Larson, 2009). The average decrease in perceived emotional regulation was surprising, as it may also increase in accordance with the emotional and cognitive maturation that occurs during adolescence (Herd et al., 2020). The strong emotional

activation in puberty may hinder adequate reappraisal of immediate situations (Blalock et al., 2016). Despite cognitive maturation, adolescents may be less likely to reappraise events and may also be less experienced (Lennarz et al., 2019). Significant variations were identified for all intra-individual changes assessed. Taken together, these findings indicate that early adolescence is a period of substantial change in perceived SECs, classroom relationships, and belief in one's potential for academic accomplishment. This highlights the importance of facilitating positive changes during the first year of lower secondary school.

Are Changes in the SECs Directly Related to Changes in AEB?

The second research question concerned the links between changes in the SECs and AEB. A strong direct association was observed between emotional regulation and AEB. Consistent with earlier research, the findings support the notion that students who can adequately reappraise situations engender optimistic emotions that can fuel motivation for learning (Pekrun, 2016). Emotions are linked to the quality of information processing (Pekrun & Linnenbrink-Garcia, 2012), and adequate reappraisal leading to optimal emotional activation levels can therefore also enhance learning.

Contrary to our expectations, intra-individual changes in relationship skills were also directly related to changes in AEB. The most likely explanation is that not all academic relationships were covered by the intermediate variables in the structural model. Among these, the important academic collaboration with support from the family was not included (Fan & Williams, 2010).

The Role of Changes in Classroom Relations as Mediators

It was anticipated that intra-individual changes in classroom relationships would mediate the associations between SECs and AEB. Changes in relationship skills showed an indirect relationship with changes in AEB, mainly via changes in collaborative peer relations. This likely reflects the strong link between changes in relationship skills and collaborative

peer relationships. Findings suggest that relationship skills are important for peer collaboration and, thereby, for growth in AEB. This also aligns with Furrer et al.'s (2014) notion that relationship skills enable supportive peer relationships regarding collaborative work, and thereby lead to more positive expectations regarding academic success. Indirect associations between changes in emotional regulation and AEB via changes in collaborative peer relations were relatively weak. However, the findings may somewhat reflect that adolescence is a period of strong emotional activation that may strain relationships in school (Eisenberg et al., 2010) and that positive changes in the ability to regulate emotions make it easier to uphold collaborative relationships with classmates, which in turn protects or enhances AEB.

The indirect association between changes in relationship skills and AEB via changes in perceived emotional support from teachers was also weak. Similarly, a weak indirect association between changes in emotional regulation and AEB via changes in emotional support from teachers was observed. Nevertheless, the findings give some support to the notion that positive developments in students' relationship skills and their ability to regulate their emotional activation in school promote relationships with teachers, which may contribute to optimism regarding ability to accomplish challenging academic tasks.

Strengths, Limitations, and Future Directions

The study's longitudinal design is considered a methodological strength, as the modeling of latent intra-individual change across two time-points may reduce the impact of stable individual characteristics and facilitate the investigation of more explicit patterns of true developmental change (Geiser et al., 2019). It should be noted that some of the variables contained missing data, and although attrition is recognized as a general phenomenon in educational research, advanced procedures were used in model estimation to handle the missing data appropriately. The present study examines short-term changes over a six-month

period. The first year of lower secondary school is an important and interesting time and we consider knowledge regarding changes and the associations between them during this period to be central. Future studies would benefit from investigating change over longer periods with more measurement points. More time points would offer greater potential for determining causal directions.

Conclusion

This study found that students' relationship skills and emotional regulation, classroom relations, and AEB on average decline in the first year of lower secondary school. However, significant variations around the average change suggest that not all students decline and support the claim that adolescence is a period of substantial individual developmental variation.

Results from the structural equation models suggest that changes in emotional regulation in particular have a role in academic efficacy beliefs. Emotional regulation, in the form of more positive reappraisals, can help students to cope with difficulties and setbacks during the learning process. This may preserve a more optimistic view of academic potential, as reflected in enhanced AEB. Moreover, a strong and positive link between changes in perceived relationship skills and collaborative peer relations, and a similar but weaker link with changes in emotional support from teachers suggest that enhanced relationship skills can improve academic collaborations among classmates and emotional support from teachers. Overall, these findings reflect the importance of stimulating students' SECs for positive developments in collaboration and support in school as well as for enhanced motivational beliefs and expectations regarding academic work.

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Appendix

An overview of model fit for longitudinal measurement models and testing for strong factorial longitudinal measurement invariance by inspecting the CFI based on criteria recommended by Cheung and Rensvold (2002).

	Longitudinal measurement models					Number of free parameters					
	χ^2 (*DF*)	*RMSEA* (90% CI)	*CFI*	*TLI*	*SRMR*		*RMSEA* (90% CI)	*CFI*	Δ*CFI*	*TLI*	*SRMR*
AEB											
Configural	1041.5 (208)	.06 (.05-.06)	.93	.92	.04	67	.06 (.05–.06)	.93	.00	.92	.04
Metric	1076.2 (218)					57	.06 (.05–.06)	.92	-.01	.92	.05
Scalar	1126.6 (228)					47	.06 (.05–.06)	.92	.00	.92	.05
Emotional support from teachers											
Configural	143.4 (34)	.05 (.04-.06)	.98	.97	.02	31	.05 (.04–.06)	.98	.00	.97	.02
Metric	151.5 (38)					27	.04 (.04–.06)	.98	.00	.98	.05
Scalar	171.8 (42)					23	.05 (.04–.06)	.97	.00	.97	.06
Collaborative peer relations											
Configural	267.7 (34)	.08 (.07-.08)	.94	.92	.03	31	.08 (.07–.08)	.94	.00	.92	.03
Metric	288.4 (38)					27	.07 (.07–.08)	.94	.00	.93	.05
Scalar	316.2 (42)					23	.07 (.07–.08)	.94	.00	.93	.06
Relationship skills											
Configural	274.1 (33)	.08 (.07-.08)	.95	.93	.04	32	.08 (.07–.09)	.95	.00	.93	.04
Metric	304 (37)					28	.08 (.07–.09)	.94	.00	.93	.06
Scalar	333.5 (41)					24	.08 (.07–.09)	.94	.00	.93	.07
Emotional regulation											
Configural	196.8 (33)	.06 (.06-.07)	.96	.95	.03	32	.06 (.06–.09)	.96	.00	.95	.03
Metric	207.8 (37)					28	.06 (.05–.07)	.96	.00	.95	.04
Scalar	221.7 (41)					24	.06 (.05–.06)	.96	.00	.95	.04

Supplementary material

Bivariate correlations for manifest variables at T1 and T2

	1	2	3	4	5	6	7	8	9	10
1. AEB T1	-									
2. AEB T2	.42**	-								
3. Teachers support T1	.26**	.22**	-							
4. Teachers support T2	.17**	.38**	.33**	-						
5. Collaborative peer relations T1	.36**	.22**	.53**	.24	-					
6. Collaborative peer relations T2	.25**	.43**	.25**	.53**	.40**	-				
7. Relationship skills T1	.34**	.21**	.29**	.10**	.50**	.25**	-			
8. Relationship skills T2	.27**	.39**	.14**	.27**	.26**	.48**	.56**	-		
9. Emotional regulation T1	.37**	.18**	.25**	.14**	.30**	.17**	.25**	.18**	-	
10. Emotional regulation T2	.20**	.42**	.17**	.28**	.21**	.32**	.21**	.28**	.34**	-

Note ** $p < .01$

Study III

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Building Social and Emotional Competencies for Coping with Academic Stress among Students in Lower Secondary School

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ABSTRACT

This qualitative study explores lower secondary school students' experiences with components of a universal school-based social and emotional learning (SEL) intervention in relation to coping with academic stress. The intervention aimed at promoting the following five social and emotional competencies (SEC): relationship skills, emotional regulation, mindfulness, growth mindset, and problem-solving. Three student focus group interviews were conducted ($n = 26$). Conventional content analysis was completed with the assistance of NVivo software. Findings suggest that the students experienced the SECs mindfulness, problem-solving, and growth mindset as supportive in coping with academic stress. Emotional regulation and relationship skills were considered more challenging to utilize, which may reflect a need for more practical exercises for these competencies. Overall, findings contribute with new knowledge on how SEL interventions can be developed to build resources among adolescents to cope with academic stress.

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Adolescence; social and emotional learning; academic stress; coping; school-based interventions

Introduction

Despite previous, promising results on how social and emotional learning (SEL) can reduce students' emotional distress, promote academic motivation, and improve peer relations in an academic context (Durlak et al., 2011), there is little empirical knowledge about how these competencies may support adolescents' coping with academic stress. The current study aims to contribute with knowledge on social and emotional competencies' (SEC) potential for stimulating coping with academic stress by exploring Norwegian lower secondary students' experiences with a SEL-intervention aiming to build such coping resources.

Adolescents report disturbingly high levels of perceived stress, primarily academic stress linked to performance expectations and academic achievements in school (Bakken, 2019; Pascoe et al., 2020). PISA results show high levels of academic stress among adolescent students within the OECD countries: 55% of students in lower secondary school felt anxious about upcoming tests, 52% felt stressed when being unable to solve an academic task, and 37% felt tense about studying in general (OECD, 2017). School-related stress is likely to challenge students' motivation for learning and reduces beliefs in the ability to establish good peer relations and secure academic support in a school context (Eriksen et al., 2017; af Ursin et al., 2020). As daily stress and hassles are some of the primary reasons for developing mental health problems (Rodríguez-Naranjo & Caño, 2016)

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which typically surface in adolescence (Reneflot et al., 2018), the increase in school-related stress should be taken seriously. Adolescence is a critical period which lays a foundation for the future stage of adult life (Steiger et al., 2014). Thus, building resources for coping with academic stress during this period seems key.

Coping with Academic Stress

Coping is a dynamic process (Brough et al., 2005) involving conscious, purposeful actions employed when an individual appraises a situation as stressful (Lazarus & Folkman, 1984). Coping includes responses directed toward resolving a stressful relationship between the person and the environment (problem-focused coping) and/or toward negative emotions that arise because of stress (emotion-focused coping). Stress is an exhausting or overwhelming experience, either internal or external, that the individual appraises as lacking resources to cope with (Lazarus, 1993). In an academic context, stress refers to states based on academic demands (Walburg, 2014). Hence, coping is the process in which students' orient thoughts and behaviors toward the goals of resolving the source of, and managing emotional reactions to, academic demands. Grades are one main concern among adolescent (Seiffge-Krenke, 2012) and lower achievements than expected, high demands from school and lacking necessary resources to cope with daily hassles as well as peer relations can all lead to stress among students (Dalen, 2014; Östberg et al., 2015). As SECs are theoretically described as interrelated processes that leads to coping (Skinner & Zimmer-Gembeck, 2007) such competencies may be a contribution in coping with academic stress.

The Potential of Coping with Academic Stress Through SEL

SEL interventions focus primarily on prevention by building resiliens (Domitrovich et al., 2017) and have shown to be most effective when implemented as universal, school-based interventions with whole classes of students (Weissberg et al., 2015; Yeager, 2017). Large-scale meta-analyses from the United States (Durlak et al., 2011; Taylor et al., 2017) and Europe (Sklad et al., 2012; Wigelsworth et al., 2016) have found that school-based universal SEL interventions have beneficial outcomes on emotion regulation and academic motivation (Korpershoek et al., 2016; Mahoney et al., 2018). A recent systematic review further indicates that the ability to regulate emotions, plan and solve problems, good relationship skills, and engaging in optimistic thinking stimulate good psychosocial health (Sande et al., 2019). This gives reason to suggest that SEL interventions focusing on building resources for coping with academic stress may have a positive influence on students perceived academic stress. However, little research has explored how students experience learning about SECs through qualitative methods (Dyson et al., 2019). Furthermore, there is a research gap in the body of empirical studies that explore lower secondary school students' experiences with SEL interventions stimulating coping with academic stress (Corcoran et al., 2018).

Building Coping Resources for Academic Stress

ROBUST is a universal school-based SEL intervention aiming to stimulate students' SECs to cope with academic stress. As good relationship skills can influence the seeking of social support as a coping strategy in a positive manner (Rowsell et al., 2016), better problem-solving strategies (Wong & Power, 2019) and a more growth-oriented mindset (Molden & Dweck, 2006) may help develop more active coping approaches, and emotional regulation and mindfulness have shown to be closely linked to emotion-focused coping (Compas et al., 2017), SECs that target such problem – and emotion-focused coping are central in the intervention. Hence, ROBUST covers the SECs relationship skills, emotional regulation, mindfulness, growth mindset, and problem-solving. The theoretical rationale for the competencies in ROBUST and how these may support coping with academic stress are further elaborated on below.

Relationship Skills

Good relationship skills include competence in how to interact socially through adequate communication (Jones et al., 2015) and how to seek social support when needed (Thoits, 2011). Being able to seek social support is associated with supportive relationships among peers and academic motivation, as well as, beliefs about coping with academic stress (Sahil & Hashim, 2011; Wentzel & Miele, 2016). Seeking support can be instrumental and emotional and lead to a sense of control that provides confidence in the ability to cope with challenging situations (Thoits, 2011). Relationship skills can be linked to problem – and emotion-focused coping strategies (Wong & Power, 2019; Zeidner et al., 2016), that are considered protective factors against stress (Rowsell et al., 2016). However, seeking social support from peers can be challenging in adolescence. The most important changes in seeking support are before the age of 16 when social support from peers becomes increasingly important (Helsen et al., 2000). Although peer support is vital during adolescence (Rowsell et al., 2016), the fear of being socially excluded is one main concern that influences students' distress (Dalen, 2014). Many students find it difficult to make friends in school and even more feel lonely in school (Bakken, 2019). Thus, in line with previous research (Eckenrode, 2013), ROBUST intends to stimulate relationship skills so that students are able to establish good relations, communicate well and seek support from peers in school as a means of coping with academic stress.

Emotional Regulation

Although educational settings may engender positive emotions like pride, enjoyment, and hope, they are also contexts for negative emotions such as boredom and hopelessness regarding academic performance (Pekrun & Linnenbrink-Garcia, 2012). Research suggests that emotion-focused coping strategies are effective at regulating emotions and reducing stress (Aldao et al., 2010). Emotional regulation involves the ability to regulate, monitor, evaluate, and modify emotional reactions (Gross & Thompson, 2007). Stress is often linked to negative emotional reactions and emotional regulation is closely linked to emotion-focused coping as it involves changing one's initial assessment of a situation to alter the elicited emotional experience that leads to a more adaptive response (Compas et al., 2017; Gross, 2015). In ROBUST, emotional regulation focus on identifying and evaluating emotions and reappraisal. The strategies are related to coping with stressful academic situations.

Mindfulness

Mindfulness involves the ability to observe thoughts and feelings as temporary events of the mind, creating the possibility to accept and re-perceive experiences more appropriately (Shapiro, 2009). This reduces stressful reflections and worrying and is closely linked to emotion-focused coping. Hence, mindfulness may increase awareness about academic stress and elicit a more realistic and adaptive response that reduces stress (Tang et al., 2015; Tharaldsen & Bru, 2011) through improved emotional regulation (Broderick & Jennings, 2012). This aligns with previous studies in which mindfulness lowers students' perceptions of stress by altering emotions and increasing the timely processing, and thus regulation of, emotional signals related to school-tasks (Chen et al., 2015; Crane & Kuyken, 2013; Tharaldsen, 2019). In ROBUST mindfulness is promoted as a way of being in the present moment, with an attitude of acceptance and non-judgement toward current experiences (Bishop et al., 2004; Hill & Updegraff, 2012). Through breathing practices and visualization techniques students may learn methods for coping with acute academic stress, and the attitude of accepting challenging academic situations. Both are believed to provide a more realistic, and less stressful, perspective on perceived academic stressors and stimulate adequate coping.

Growth Mindset

Growth mindset enhances students' optimism and beliefs about accomplishing challenging schoolwork (Claro et al., 2016). Coping actions vary with individual beliefs (Lazarus, 1993), and students' beliefs or mindset can influence how they interpret – and cope with school-related tasks and performances. The operationalization of adequate coping strategies may thus function as a protective factor against stress in an educational setting (Molden & Dweck, 2006; Schroder et al., 2017). A growth mindset is purported to protect against educational demotivation (Aditomo, 2015), and reduce stress related to academic challenges (Moksnes & Lazarewicz, 2019; Murberg & Bru, 2004). Belief in the ability to cope with academic challenges also alleviates associated stress (Doron et al., 2009). That intelligence is malleable and developed through effort (Dweck, 1999) is emphasized through growth mindset in ROBUST. This competence may influence students' motivation to take on challenging academic tasks that otherwise could have been perceived as overwhelming.

Problem-solving

Problem-solving is closely linked to self-regulated learning (SRL) and includes goal-oriented strategies that regulate learning behavior and learning processes by selecting, monitoring, and planning for strategies that facilitate academic learning (Schunk & Zimmerman, 2012). Adequate problem-solving increases students' feelings of control and predictability (Compas et al., 2017), which are central in problem focused coping with stress (Lazarus, 1993). Problem-solving in an educational context is associated with positive academic beliefs and a reduction in school-related stress (Wong & Power, 2019). In ROBUST problem-solving aims at teaching students' systematic approaches to solve problems. Planning is central, which is an adaptive coping strategy regarding academic stress. Hence, problem-solving may contribute to students' coping with academic stress.

Based on the above, it seems that the SECs relationship skills, emotional regulation, mindfulness, growth mindset, and problem-solving as presented in ROBUST could support adolescents when coping with academic stress.

The Current Study

The main aim of the current study was to explore how a sample of Norwegian eighth-grade students in lower secondary school experienced the SECs relationship skills, emotional regulation, mindfulness, growth mindset, and problem-solving when coping with academic stress.

The study posed the following research questions:

(1) How did the students experience the social and emotional competencies as presented in ROBUST?
(2) If the competencies were perceived as supportive strategies for coping with academic stress, how? If not, why?

Method

Due to the lack of empirical research on adolescents' perceptions of SEC for building coping resources for academic stress, a qualitative, explorative research design was chosen. Focus group interviews were considered the appropriate data-gathering method as they generate a rich understanding of participants' experiences with an intervention (Krueger, 2014; Morgan, 1993) and make collective sense of the phenomenon under study (Lune & Berg, 2016).

The Robust Intervention

University staff, researchers and lower secondary school teachers cooperated in developing the universal school-based ROBUST intervention. It was delivered class-wise on a weekly basis during regular school hours by primary teachers who had attended a five-day training course. ROBUST was carried out during the 2018–19 school year. A total of 20 sessions were carried out, each of which lasted 60 min, and each topic lasted four sessions. Each session contained lectures, group assignments, and activities. An overview of the structure and content of ROBUST is presented in Figure 1.

Participants

545 students from 28 classes of eighth-grade[1] students in 11 lower secondary schools in a municipality in Eastern Norway participated in the intervention. In accordance with demographic variations, informants were recruited from each of three identified geographic areas within the municipality. This categorization was recommended and performed by staff from the municipality. One school from each area was randomly selected. To ensure that the number of participants in the focus group interviews was satisfactory (Krueger & Casey, 2002), 12 students at each school were initially invited to participate. A total of 26 students participated in three focus group interviews, eight from school one (four girls and four boys), eight from school two (six girls and two boys), and 10 from school three (five girls and five boys). Hence, the number of participants in each focus group was sufficient. Of the total sample, 11 were male and 15 were females, all between 13 and 14 years of age ($n = 26$). The remaining 10 students did not give a reason for declining to participate in the interviews.

Data Collection and Procedure

An open-ended, semi-structured interview guide was developed for the interviews. The main themes concerned students' experiences with the SECs from the intervention in relation to coping with academic stress. The interviews were conducted approximately one month post intervention.

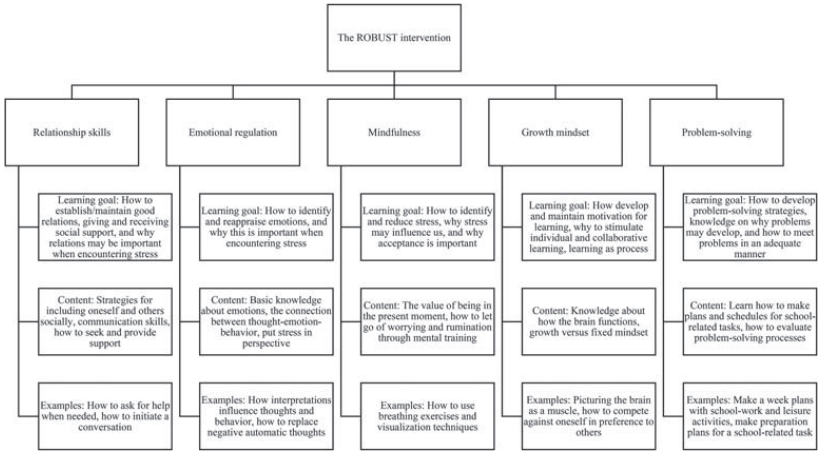

Figure 1. An overview of the structure, learning goals, content, and examples of strategies of ROBUST.

The study involved extended focus groups (Berg et al., 2004), which introduces the main topics from the interview guide to participants prior to the interview. This procedure increases the trustworthiness of the data by making the informants aware of personal opinions regarding interview themes before the interview, thus increasing the likelihood that participants will express their opinion during the focus group interview (Breen, 2006). Two female researchers, experienced with and trained in qualitative research, conducted the interviews at the respective schools during school hours in accordance with the focus group interview guidelines (Krueger, 2014). Each interview lasted 60-90 min, was audio-recorded, and transcribed verbatim. No new information emerged after the third interview and findings between the three groups overlapped. Hence after the third interview data saturation (Saunders et al., 2018) and sufficient information power (Malterud et al., 2016) were considered to provide satisfactory descriptions of the phenomenon under study.

Analysis

Conventional content analysis, commonly used when aiming to describe a phenomenon of which existing theory and/or research is scarce (Hsieh & Shannon, 2005), was performed with the assistance of NVivo 12. Initially data was analyzed separately. Categories flowed from the data using inductive category development (Mayring, 2004). First, codes that captured key concepts were made. Then, codes were sorted into categories which was structured hierarchically. As findings from the focus groups were coincident, data was finally categorized within the same dimensions and narrowed down to dimensions and sub-dimensions (Patton, 2002). The researchers discussed the findings and came to agreement on the analysis and the dimensions generated by the data.

A member check (Miles et al., 2019) was carried out as it increases the trustworthiness of the analyses by giving the informants the opportunity to provide feedback on the initial analyses. The member check was carried out by e-mail for practical reasons. None of the students indicated any need for changes, thus the initial analyses were used in the continued work with the data.

Ethical Considerations

The study was formally approved by the Norwegian Social Science Data Services (NSD). All ethical guidelines were followed. Voluntary informed consent was gathered from parents or guardians, as well as from the participants, prior to data collection.

Findings

Two main dimensions were identified from the content analysis: "supportive competencies" and "challenging competencies". The first dimension comprised three sub-dimensions: "mindful acceptance", "making plans", and "strengthened motivation". The second dimension included the sub dimension: "Potential benefits and difficulties". With the intention of strengthening the trustworthiness of the findings, quotes from all three focus groups are presented as equally as possible. To increase transparency an overview of the total study quotes is presented in Table 1. To protect the anonymity of the participants, pseudonyms are used, and reference to the respective school represents the focus group to which the respective student belong.

Supportive Competencies

The majority of the informants found the SECs mindfulness, problem-solving, and growth mindset as helpful for coping with academic stress. Findings regarding mindfulness and problem-solving

[1]The eighth grade in Norway corresponds to the first year of lower secondary school.

Table 1. An overview of the overall quotes.

	Mindfulness	Problem – solving	Growth mindset	Emotional regulation	Relationship skills
Supportive competencies	32	20	8	8	8
	[26]	[18]	[8]	[8]	[6]
Challenging competencies	9	4	3	17	13
	[8]	[3]	[3]	[11]	[6]
References in total	41	24	11	25	21
	[24]	[21]	[11]	[19]	[12]

Note: Number of informants providing quotes are indicated by brackets ($n = 26$).

overlapped somewhat in that the competencies were perceived as supportive when preparing for and when working with academic tasks. Growth mindset, on the other hand, reflected an attitude towards learning perceived as supportive in that it motivated the students.

Mindful Acceptance

When stressed about academic work, e.g., prior to giving a presentation, most of the informants found mindfulness exercises such as mindful breathing to be supportive, as stated by Trude (school 2):

> I find it useful to take deep breaths, and to use the breathing exercise, when I am stressed before presentations in school.

This was also the case for Mia (school 1), but in a more general manner regarding schoolwork:

> The breathing exercise has helped me to relax [about academic work]. It made it easier for me to handle stress by accepting and letting go of it.

The informants expressed that mindfulness supported their ability to cope during stressful encounters such as during tests at school, as exemplified by Nora (school 3):

> I can get stressed during a test and it feels like I've not rehearsed enough. We've learned to stop, empty the head of thoughts, and to breathe. Then it works out fine for me.

Most informants found exercises for mindful acceptance helpful when coping with negative thoughts that arose when encountering new learning material or when being challenged by academic tasks, as exemplified by Emma (school 1):

> To accept and let go helps a lot when I have thoughts that I find unhelpful and that I don't like having about schoolwork.

Informants agreed that being mindful contributed to developing increased awareness and acceptance of the present moment and supported their ability to cope with challenging academic situations. The stated reason was that instead of worrying about a difficult task they had learned to focus on one thing at a time and to not let negative thoughts or difficult tasks interfere with their work, as stated by David (school 2):

> It happens quite often that one is stressed before tests (…). Before I used to be stuck at a question for a long time. But now I proceed to the next one, and [think that] the answer will come to me.

Making Plans

The majority of the informants expressed that learning a stepwise procedure to solve and evaluate academic problems was helpful to cope with school-related tasks that would otherwise be perceived as stressful. Similar to the use of mindfulness strategies to cope with stress, the stepwise problem-solving procedure was emphasized as relevant, especially in relation to preparing and conducting academic tests, as stated by Thomas (school 1):

> First, I think it through [the steps] and then I do it, [I] consider the different ways to handle a math test or a Spanish test.

A similar experience was stated by Stine (school 3) regarding preparation for academic tests:

> I have tried to prepare for tests and to reduce the stress that usually occurs if I start practice the evening before the test.

Most of the informants emphasized that learning about problem-solving supported how they appraised and coped with school-related tasks, either at school or at home. They expressed that problem-solving provided new knowledge of how to make plans and structures which supported their coping ability with school-related stress, as expressed by Line (school 1):

> I have changed the way I think about how to structure homework. Before, I was stressed about doing homework, spending every minute of my time [on it]. Now, I prioritize some homework over others, and I've become better in structuring. I automatically become less stressed about homework.

This was further exemplified by Lotte (school 2) in that the ability to choose was strengthened:

> It makes it easier for me to make plans for which day to do the different homework. It is a lot easier because I have a clear idea of what to do when.

Strengthened Motivation

The informants expressed that growth mindset highlighted the connection between academic work, the development of the brain, and learning possibilities. The competence was identified as a motivation for learning, as exemplified by Mona (school 2):

> When we learned about the brain [growth mindset] it made me want to learn more. I remember we were taught that in this period of life [adolescence] one's ability to learn is so much higher than in any other period of life. Thus, I want to use this period for learning, making the most out of it.

Informants agreed that a growth mindset differed somewhat from their initial perception about learning as an inborn talent. They emphasized that learning about a growth mindset influenced their perspective that learning was more process-oriented, as stated by Hans (school 1):

> Before I did not know that the brain was like a muscle that strengthens through exercise. I thought everybody had different talents, and if you are good at something, it is fixed. (…) Then I became aware that the brain can acquire new skills if one only works hard enough.

Informants expressed that a growth mindset encouraged a more learning-oriented perspective on making mistakes through strengthening their beliefs about learning, as expressed by Dennis (school 3):

> Growth mindset, I think, is rather important because it focuses on the part of learning which concerns doing mistakes, and most important, how to handle such mistakes.

Although the informants agreed that growth mindset strengthened their beliefs about learning, they also experienced it to be a bit complicated to begin with, as stated by Ole (school 1):

> Learning that the brain work as a muscle was a bit complicated to understand in the beginning. (…), but eventually, I saw it rather useful. I thought 'this is useful to learn'.

Challenging Competencies

The informants expressed that competencies related to emotional regulation and relationship skills were somewhat challenging to utilize, even while conveying that they perceived it as important to strengthen them.

Potential Benefits and Difficulties

Many informants stated that dealing with strong emotions was particularly difficult during adolescence and that strategies for emotional regulation were challenging to use in coping with academic stress in this period of their lives, as exemplified by Leonora (school 2):

> It seems [that it is] very easy to just change your feelings right away, but when you are in a situation, it is challenging to think of something positive when you have negative thoughts.

The majority of the informants experienced that their peers also perceived emotional regulation to be a challenging competence regarding coping with academic stressors, as expressed by Line (school 1):

> The ones [peers] I talked with said that they had to follow their own emotions instead of regulating them and that this was the only way for them to handle emotions.

The notion was also supported from Mario (school 2), who had tried to identify and change negative thoughts:

> I have tried to think differently about the situation, but I did not manage to stop and think about the situation in a more positive manner.

Although many informants perceived emotional regulation to be somewhat challenging, they expressed that it would be beneficial to learn how to use emotional regulation to cope with academic stress, as exemplified by Ole (school 1):

> We all have strong feelings in adolescence. With various and strong emotions and thoughts it seems beneficial to learn how to regulate emotions.

The informants expressed more mixed experiences with relationship skills. The majority agreed that learning about relationship skills had, to some degree, changed the learning environment by increasing their tolerance toward peers and perhaps broadening their knowledge of social responsibility. As stated by Ole (school 1):

> People [peers] say that others have feelings as well, and instead of us just saying that, we [the students] saw it in a way, at a much deeper level how different actions would affect others and how others felt.

The informants emphasized that the issue of time had to be considered when discussing relationship skills. The discussion revolved around whether it was the time spent together that allowed them to develop this competence or if it was the actual learning of relationship skills from the intervention that influenced the social interaction between peers, as stated by Anne (school 1):

> We didn't know each other, so, it is difficult to say what influenced us; ROBUST, or if it [relationship skills] just evolved during the school year.

Discussion

The main aim of this study was to explore whether the social and emotional competencies (SEC) relationship skills, emotional regulation, mindfulness, growth mindset and problem-solving were perceived as supportive regarding coping with academic stress among a sample of lower secondary school students. The findings suggest that the students found mindfulness, problem-solving and growth mindset supportive to build coping resources for dealing with academic stress. In the case of emotional regulation and relationship skills, the findings were more mixed.

Supportive Competencies

Students seemed to perceive mindful breathing exercises as beneficial in terms of reducing negative thinking about upcoming academic performances. Mindful breathing exercises may have

strengthened the students' awareness of the present moment and hence making them more able to focus on the task at hand, instead of ruminating or worrying about similar situations from the past or future. The finding is supported by previous research suggesting that mindfulness increases the capacity to pay attention and improve concentration (Biegel et al., 2009; Broderick & Frank, 2014). Furthermore, the findings suggest that mindfulness strengthens the students' ability to cope with academic stress by becoming more accepting of the stress they experience, rather than worrying about academic performances. Research indicate that mindfulness brings forth an increased cognitive flexibility and enhanced level of acceptance (Chambers et al., 2009; Roemer et al., 2008). Accordingly, the findings from the current study may suggest that mindfulness stimulated the students' adequate emotion-focused coping strategies by strengthening their acceptance of stressful academic situations. The findings of this study further suggest that stimulating problem-solving may aid students in organizing their academic work, thus supporting their ability to cope with potential academic stress. Making plans for academic tasks, preparing for tests, and making schedules for schoolwork was experienced as particularly useful. This finding may be due to the relation between problem-solving and self-regulated learning (SRL), where the latter is known to involve a goal-oriented attitude of planning, monitoring, and conducting the process of academic work (Zimmerman & Moylan, 2009). Such goal-oriented planning may provide a sense of control regarding school-related tasks. A similar finding regarding the positive influence of SRL strategies on coping with stress has been proposed elsewhere (de la Fuente et al., 2015). Hence, creating more predictability of academic work through problem-focused coping strategies such as problem-solving may reflect a stronger sense of control when encountering academic stressors. Mindfulness practices and problem-solving strategies may have been perceived as supportive due to their concrete nature. Practices such as breathing exercises and making plans may actively engage students and hence making it easier to utilize. The benefits of active coping strategies, planning and learning positive reinterpretations among others have been advocated previously (Carver & Scheier, 2017). However, further studies are needed to gain more knowledge on the relation between such strategies.

Findings from the current study indicated that growth mindset was beneficial in terms of increasing students' optimistic thoughts about learning. This seems to have strengthened their belief in being able to master academic challenges and their motivation for coping adequately with challenging academic tasks. It has been shown that growth mindset positively influences students' abilities to cope with stressors in a more general manner (Kilby & Sherman, 2016). The use of cognitive strategies in learning processes may be associated with coping through a shift in students' mindset toward a more positive attitude regarding effort and motivation for schoolwork. This could relate to students' awareness of how intelligence can be understood as a malleable developmental feature (Dweck, 1999) and to students' understanding of academic learning as a process that requires effort and persistence. However, growth mindset was initially experienced as complicated but developed to be perceived as motivating for learning. This may reflect that growth mindset is indeed malleable and can motivate students' academic learning processes.

Challenging Competencies

Regarding emotional regulation and relationship skills the findings were more mixed, suggesting that students perceived these competencies as more challenging to stimulate and utilize. Negative emotions occur more often in adolescence (Chaplin & Aldao, 2013), which may explain why the students found emotional regulation strategies challenging as it may be somewhat overwhelming to work with ongoing negative emotions. It could also be that emotional regulation was experienced as too abstract to utilize when coping with academic stress. However, as adolescents may experience strong emotions, both in general and in regard to academic challenges, they likely require such strategies, but may need a longer period of time to develop emotional regulation strategies before they experience these approaches helpful in coping with academic stress. Similar arguments have been made (Tharaldsen, 2019).

Findings regarding relationship skills suggest that the students experienced positive changes in social interaction in the learning environment, however, there was also uncertainty as to whether this was due to specific relationship skills or if such skills had developed regardless of the intervention. The time-factor in regard to change may argue in favor of a need for adolescents to learn more explicitly about how to use relationship skills that may facilitate supportive learning that reduces stressful encounters in the learning environment. This suggestion is consistent with previous research (Goldberg et al., 2019) and in line with previously mentioned challenges of social interaction during adolescence, i.e., fear of being excluded (Dalen, 2014) and difficulties in establishing friendships (Bakken, 2019). The current findings, therefore, may suggest that students need a longer period in which to practice relationship skills to perceive it as a useful resource for coping with academic stress. That relationships are reciprocal and involve peers should also be considered. Young adolescents develop new and complex social relations, and additionally experience both positive and negative influences of social interaction that are important during this stage in life. This may bring forth challenges to using relationship skills as a way of coping with academic stress, which may be the case in the current findings. For a student to benefit from strengthened relationship skills, peers need to be inclusive and supportive. Perhaps the current and mixed findings reflect that the intervention needs to have a stronger emphasis on the social responsibility for including fellow peers to strengthen the students' perception of relationship skills as beneficial. Finally, skills for identifying emotions are crucial for developing and maintaining interpersonal relationships and a reciprocal relationship has been found between awareness of emotions and social support (Rowsell et al., 2016). Therefore, that both emotional regulation and relationship skills were perceived as challenging are perhaps not that surprising. Future studies are needed to explore this relationship further.

Strengths and Limitations

The current findings were based on qualitative focus group interviews. Perceptions and experiences expressed by the informants provided important first-hand information about how the target group reacted to the stimulation of the five SECs aimed at promoting coping with academic stress. However, social conformity may influence the communication process (Norris et al., 2012), and the social influence that occurs among adolescents may have made it difficult for the informants to disagree with peers and to express their own opinions during the interviews. To strengthen individual voices and the trustworthiness of the data and findings, the focus group interviews were conducted by experienced researchers, were extended, and involved a member check.

Due to little previous research, the study's findings may contribute with important knowledge to the field by informing the design and content of universal SEL interventions for adolescents aiming to deal with academic stress. The current study is a first step towards exploring student's perception of the SECs in coping with academic stress. Future studies should additionally focus on the possible interrelationship between the SECs under study.

Concluding Remarks

This study explored lower secondary school students' experiences with five SECs regarding coping with academic stress. The findings suggest that mindfulness support the adaptive use of emotion-focused strategies in academically challenging situations, that strengthened problem-solving may contribute to a stronger feeling of control in planning and solving academic tasks, and that stimulating a growth mindset may influence effort and academic mastery expectations among students. The findings further suggest that strategies within these areas are perceived as easier to utilize than relationship skills and emotional regulation. The latter finding could reflect the design of the different topics in the SEL intervention that was carried out. In the case of relationship skills, it may also be that the students found these skills more difficult because adolescence is a socially challenging

time in life. For the development of relationship skills to help cope with academic stress, it seems adequate to also work with collaborative contexts in the classroom. Furthermore, emotions are often strong and difficult to regulate in adolescence. This may indicate that special care should be taken regarding this topic when designing an educational approach to SECs. It may be adequate to facilitate interventions over longer periods and with more practical applications than what was the case in this study. However, the current findings provide new knowledge on how adolescents perceive the five SECs in ROBUST regarding building coping resources for academic stress. Findings also support the need for future SEL interventions with this aim in mind. More research is needed to explore the current and other SECs further to design and implement future SEL interventions aiming to build resources for coping with academic stress in adolescents.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

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