



TEACHERS' EMOTIONS AND BELIEFS: INTERTWINED WITH TEACHERS' SUPPORT FOR STUDENTS' PSYCHOLOGICAL NEEDS

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Abstract

This dissertation aimed to investigate the significance of and the associations between teachers' support for autonomy, competence, and relatedness as well as teachers' emotions and beliefs in the classroom. To my knowledge, there is a lack of empirical research that simultaneously investigates the essence of and the relationship between these variables. Specifically, my doctoral work aimed to deepen the understanding of teachers' emotional experience, emotion regulation, emotion expression, support for autonomy, competence, and relatedness, controlling teaching, and teachers' beliefs, both theoretically and empirically; to develop valid methods for systematic analysis of these variables; and to provide educational implications for the fostering of teachers' positive beliefs and emotions as well as effective teaching to support students' psychological needs. This dissertation comprises three studies to achieve these aims.

In *Study I*, the aim was to investigate teachers' emotion regulation strategies and relate them to students' perceptions of their teachers' emotions, using students' surveys and teachers' interviews. Four teachers and 53 students in Grades 7 to 9 in an international lower-secondary school in Finland participated in this study. All students completed surveys eliciting their perceptions of their teachers' emotions during teaching. After the students were surveyed, each teacher participated in a semi-structured interview concerning their emotional experiences and emotion regulation strategies when teaching a particular class. The frequency of display of teachers' emotions during teaching, as perceived by the students, was then calculated. Based on Gross's process model of emotion regulation, a deductive template approach was employed to frame the analysis of the interviews. The results suggested that antecedent-focused emotion regulation might be more desirable than response-focused emotion regulation. In particular, reappraisal appeared more effective than suppression in increasing the expression of positive emotions and reducing the expression of negative emotions. Additionally, the findings suggested that a strategy of suppression should be discouraged, given that it may decrease positive-emotion expression and increase negative-emotion expression, and may hinder the development of positive teacher-student relationships in a cyclic process. Finally, this study indicated that teachers' beliefs play an important role in teachers' interpretation of challenges and their employment of emotion regulation strategies. This study also deepened our understanding of teachers' emotions and provided a solid foundation for Study II.

In *Study II*, the aim was to explore teachers' beliefs and emotion expression via semi-structured interviews with teachers and to discuss the findings in relation to Self-Determination Theory, which addresses teachers' support for autonomy, competence, and relatedness. The participants were comprised of six teachers in Grades 7 and 9 from a multicultural school in Finland. Each teacher participated in a semi-structured interview concerning emotional experience and emotion expression when teaching a particular class. Teachers' emotion expression was coded using

deductive thematic analysis, in which an analytical scheme was developed *a priori* based on the theoretical constructs from a systematic literature review. Teachers' beliefs were inferred from teachers' accounts of their emotional and teaching experiences and were coded by combining deductive and inductive thematic analysis. This study found that teachers' beliefs about their roles as educators, carers, and providers of reassurance reflected the importance of expressing clear expectations, caring for students, and considering students' perspectives and feelings. Teachers' beliefs about equality between teachers and students appeared to be connected with trust in students and encouragement of their self-initiation. Teachers' beliefs about closeness to students reflected the importance of caring for students. Teachers' expression of negative emotions by discussing the problem with students conveyed explanatory rationales for expected student behaviors. This study revealed that teachers' beliefs about teacher-student power relations might be connected with teachers' appraisals of students' misbehaviors. The findings also suggest that teachers need to discuss the problem with students rather than lose their tempers or suppress their emotions when they feel a need to direct-stage or intentionally express anger. Future research could investigate the issue of teachers' faking a particular emotion, such as faking indifference, which was found in this study. Future research could also explore the reasons for, and harmfulness of, embracing beliefs, e.g., negative expression of anger as a safety belt (to secure teachers against the offensiveness of students' misbehaviors). This study also provided insights into autonomy-supportive teaching for the design of Study III.

In *Study III*, the aim was to explore teachers' autonomy-supportive and controlling behaviors through case studies that used video analysis. The two participating teachers were from a secondary school in southwestern Finland. Four lessons presented by these teachers were videotaped during their regular teaching. All verbal interactions in the videos were transcribed and subtitled in English for data analysis. The coding schemes were developed *a priori*, based on an extensive review of the literature addressing autonomy support and control. Three researchers coded teachers' utterances (verbal) and also interpreted teachers' tones and gestures (nonverbal), using the linguistic annotation software ELAN (2017). The results showed that teachers employ both autonomy support and control to different extents, and the use of autonomy support and control may be contingent on different contexts. This study also found novel evidence of error tolerance as a category of teachers' autonomy-supportive teaching. This strategy has not been investigated from the perspective of autonomy support in previous research. Further, the findings indicated that indirect control, which includes creating ego-involvement and conditional regard, and its effects on students' learning and well-being in classroom contexts should be explored further in future research. It was also found that teachers may offer choices about the layout of classroom activities and the selection of learning materials, but may pay less attention to choices about independent student opinions of the learning content. The results also indicated that controlling language may not have utility in motivating student classroom activities as expected

by teachers. Finally, this study suggested that different teaching experiences related to responsibility and accountability may influence teachers' adoption of autonomy-supportive or controlling teaching strategies.

In sum, the three studies convincingly indicated that teachers' emotions and beliefs are intertwined with their support for students' autonomy, competence, and relatedness. Teachers should be encouraged to embrace empathy beliefs to interpret challenging situations, modulate emotional experiences, and foster close and supportive relationships with students. Also, teachers should be discouraged from using suppression as their emotion regulation strategy and encouraged to employ reappraisal to interpret challenges meaningfully during teaching. When teachers feel a need to express their negative emotions, losing their tempers or suppressing their feelings should be discouraged, and discussing the problem with students is recommended. Moreover, teachers' beliefs about their roles, teacher-student power relations, professional distance, and their negative emotion expression can be discussed in light of the prominent constructs of autonomy, competence, and relatedness support, highlighted in the Self-Determination Theory (SDT) literature. Hence, this dissertation suggests that teachers' beliefs are valuable and should be included in the investigation of teachers' support for students' psychological needs and teachers' emotions. Furthermore, the complexity of autonomy support and control indicated that teachers should be encouraged to self-reflect on the motivational strategies they employ and recognize their effects on students' learning and well-being. This dissertation validated collecting quantitative data from students to explore teachers' display of emotions and simultaneous examination of teachers' emotion regulation strategies in light of students' perceptions. This dissertation also validated the use of semi-structured interviews to explore teachers' beliefs and emotion expression and inferring teachers' beliefs from teachers' accounts of their emotional and teaching experiences. Video analysis, used in the study concerning autonomy support and control, pinpoints the value of exploring more potential categories of autonomy-supportive and controlling teaching, such as error tolerance, found in the study.

Keywords: teachers' emotions, students' perceptions, emotion regulation, emotion expression, autonomy support, competence support, relatedness support, controlling teaching, teachers' beliefs.

Tiivistelmä

Tässä väitöskirjassa yleisenä päämääränä oli tarkastella sitä, millaisten merkityssisältöjen vallitessa opettajien tunteet ja uskomukset sekä heidän kannustuksensa autonomiaan, osaamiseen ja yhteenkuuluvuuteen jäsenyivät luokkahuoneissa. Tietääkseni ei ole aikaisempaa empiiristä tutkimusta, jossa samanaikaisesti olisi tutkittu näiden edellä mainittujen muuttujien olemusta ja keskinäistä suhdetta. Erityisesti väitöskirjani tavoitteena oli syventää ymmärrystä opettajien tunnekokemuksista, tunteiden säätelystä, tunteiden ilmaisusta, uskomuksista, kannustamisesta autonomiaan, osaamiseen sekä yhteenkuuluvuuteen ja opettamisen hallintaan, jotta voidaan kehittää päteviä menetelmiä joiden avulla voidaan analysoida näitä muuttujia systemaattisesti. Tutkimuksen avulla voidaan saavuttaa kasvatustieteellisiä seurannaisvaikutuksia, joilla voidaan edistää opettajien myönteisiä käsityksiä ja tunnekokemuksia sekä tehokasta opettajuutta, ja joiden avulla kyetään vastaamaan opiskelijoiden psykologisiin tarpeisiin. Näiden tavoitteiden saavuttamiseksi väitöskirja on tehty siten, että se koostuu kolmesta osittain toisiaan täydentävästä osasta.

Ensimmäisessä tutkimuksessa tavoitteena oli oppilaille teetettyjen kyselytutkimusten ja opettajahaastattelujen avulla tarkastella opettajien tunnesäätelystrategioita ja suhteuttaa saatuja tuloksia oppilaiden havaintoihin opettajien tunnetiloista. Tähän tutkimukseen osallistui neljä opettajaa ja 53 yläkouluikäistä oppilasta suomalaisesta kansainvälisestä peruskoulusta. Oppilaat esittivät kyselytutkimuksessa kantansa siitä, millaisessa mielentilassa he kokivat opettajan olevan opetustilanteessa. Oppilaille suunnattujen kyselyiden jälkeen jokainen opettaja osallistui teemahaastatteluihin, joissa tiedusteltiin heidän tunnetilojaan ja tunnesäätelystrategioitaan tietyillä oppitunneilla. Oppilailta kysyttiin, miten usein he kokivat opettajan näyttäneen jonkin tunnetilan opetustilanteessa. Nämä tunnetilat nimettiin ja laskettiin. Haastattelujen tuloksia tarkasteltiin deduktiivisen sisältöanalyysin avulla ja Grossin tunteiden säätelyn prosessimallin valossa. Tulosten perusteella havaittiin, että tilannesidonnaiset keinot saattavat olla reaktiosidonnaisia keinoja hyödyllisempiä opettajien tunteiden säätelyssä. Erityisesti tunteiden uudelleenarviointi vaikutti tunteiden tukahduttamista tehokkaammalta tavalta, kun pyrkimyksenä oli lisätä myönteisten tunteiden ilmaisua ja vähentää kielteisten tunteiden näyttämistä. Lisäksi löydösten perusteella havaittiin, että tunteiden tukahduttamisen strategiaa ei tulisi suosittaa, koska se saattaa vähentää myönteisten tunteiden ilmaisua ja lisätä kielteisten tunteiden esiintuomista, mikä voi vaikeuttaa myönteisen opettaja-oppilassuhteen rakentumista säännöllisessä opetustoiminnassa. Lopuksi tutkimus osoitti, että opettajien uskomuksilla on merkitystä sille, miten he tulkitsevat haasteita ja käyttävät tunnesäätelystrategioita. Tämä tutkimus syvensi myös ymmärrystämme opettajien tunteista ja loi vankkaa pohjaa toista tutkimusta varten.

Toisessa tutkimuksessa tavoitteena oli teemahaastattelujen avulla tarkastella opettajien uskomuksia ja tunteiden ilmaisuja sekä keskustella tuloksista itseohjautuvuusteorian valossa niiltä osin kuin se toi lisäymmärrystä tapoihin, joilla

opettajat kannustivat oppilaita autonomiaan, osaamiseen ja yhteenkuuluvuuteen. Haastatteluihin osallistui kuusi suomalaisen monikulttuurisen yläkoulun opettajaa. Jokainen opettaja osallistui teemahaastatteluihin, joissa käsiteltiin heidän tunnekokemuksiaan ja tunteiden ilmaisujaan tietyillä oppitunneilla. Opettajien tunneilmaisut koodattiin deduktiivisen teema-analyysin avulla, mikä toteutettiin siten, että teoreettinen rakenne muotoiltiin järjestelmällisen kirjallisuuden arvioinnin pohjalta, minkä jälkeen analyttinen suunnitelma oli valmis *a priori*. Opettajat kertoivat tunnetiloistaan ja opetuksen yhteydessä koetuista tuntemuksista ja näiden ilmaisujen pohjalta tehtiin yhteenveto opettajien näkemyksistä, minkä jälkeen ne koodattiin deduktiivisen ja induktiivisen teema-analyysin avulla. Tutkimuksen myötä selvisi, että opettajien näkemykset rooleistaan kasvattajina, välittäjinä ja tyynnyttäjinä heijastelivat sitä, että on tärkeää ilmaista selkeästi odotuksistaan ja huolenpidostaan, ja että opettajien on keskeistä huomioida oppilaitensa näkökannat ja tunteet. Opettajien näkemykset tasavertaisuudesta opettajien ja oppilaiden välillä näyttivät valavan luottamusta oppilaisiin, minkä seurauksena aloitteellisuuteen kannustaminen helpottui. Opettajien näkemykset läheisyydestä oppilaisiin kuvastuivat oppilaista välittämisen tärkeytenä. Opettajat, jotka ilmaisivat negatiivisia tuntemuksiaan keskustelemalla ongelmista oppilaidensa kanssa, välittivät samalla näille uskomuksiaan oppilailta odotetusta käytöksestä. Tutkimus osoitti, että mikäli halutaan ymmärtää taustaa sille, miten opettajat arvioivat oppilaiden huonoa käytöstä, olisi mielekästä tarkastella opettajan ja oppilaan välillä vallitsevia valtasuhteita. Tulokset osoittavat myös, että opettajien olisi pikemminkin syytä keskustella ongelmista oppilaiden kanssa sen sijaan että he menettävät malttinsa tai tukahduttavat tuntemuksensa, kun heille syntyy tarve ilmaista suuttumustaan suoraan. Tulevaisuudessa toteutettavissa tutkimuksissa voitaisiin tarkastella sitä, että opettaja teeskentelee tiettyä tunnetilaa. Tässä tutkielmassa havaittiin vain välinpitämättömyyden teeskentely. Tulevissa tutkimuksissa voitaisiin myös tarkastella syitä ja haittoja sille, että tiettyjä uskomuksia omaksutaan opetustilanteessa: opettaja saattaa esimerkiksi kokea, että suuttumuksen näyttäminen suojelee häntä oppilaiden huonolta käytökseltä ja osoittaa näille, mikä on hyväksyttävää ja mikä ei. Tutkimus toi myös syvempää ymmärrystä itsenäisyyteen kannustavaan opettamisen tapaan, jota käsitellään tarkemmin kolmannessa tutkimuksessa.

Kolmannessa tutkimuksessa tavoitteena oli videoanalyysiä hyödyntävän tapaustutkimuksen avulla tarkastella opettajien tapoja kannustaa autonomiaan ja hallita oppilaitaan. Kaksi tutkimukseen osallistunutta opettajaa olivat yläkoulusta Lounais-Suomesta. Neljä näiden opettajien normaalia oppituntia kuvattiin videolle. Kaikki tuntien aikana käydyt keskustelut translitteroitiin ja käännettiin englanniksi data-analyysiä varten. Aluksi perehdyttiin laajasti autonomiaan kasvattamista ja oppilaan hallintaa käsittelevään kirjallisuuteen, minkä pohjalta koodaussuunnitelmat kehitettiin *a priori*. Kolme tutkijaa kirjasi opettajien sanalliset lausumat ja tulkitsivat näiden äänensävyjä sekä sanattomia eleitä kielentutkimuksessa käytetyn ELAN-ohjelmiston avulla. Tulokset osoittivat, että opettajat hyödynsivät sekä autonomiaan

kannustamista että oppilaan hallintaa eri suhteissa, ja että se miten kyseisten tapojen käyttö saattoi riippua kulloisestakin tilanteesta tai asiayhteydestä. Tutkimuksessa ilmeni myös, että virheensieto opetustilanteessa voitaisiin jatkossa nimetä alakategoriaksi, kun kyse on opettajien strategiasta kannustaa oppilaita autonomiaan. Tätä seikkaa ei ole tutkittu aiemmissa autonomiaan kannustamista käsittelevissä tutkimuksissa. Lisäksi tulokset osoittivat, että jatkossa olisi tutkittava, miten epäsuora kontrolli (egon osallistaminen ja ehdollinen huomio) vaikuttaa oppilaan oppimiseen ja hyvinvointiin luokkaopetuksessa. Havaittiin myös, että opettajat saattoivat antaa oppilaiden valita erilaisten opetusta koskevien seikkojen, kuten tuntien rakenteen ja oppimateriaalien, väliltä, mutta eivät juurikaan huomioineet oppilaiden mielipiteitä opetettavasta sisällöstä. Tulosten perusteella huomattiin lisäksi, ettei kontrollia ilmentänyt kielenkäyttö välttämättä motivoi oppilaita siten kuin opettajat saattoivat kuvitella. Lopuksi tämä tutkimus osoitti, että erilaiset opetuskokemukset, -vastuut ja -velvollisuudet saattavat vaikuttaa siihen, käyttääkö opettaja opetusstrategianaan autonomiaan kannustusta ja oppilaiden hallintaa.

Yhteenvedona todettakoon, että nämä kolme tutkimusta osoittivat, että opettajien tunnekokemukset ja uskomukset linkittyivät autonomiaan, osaamiseen ja yhteenkuuluvuuteen kannustamiseen. Kun opettajat joutuvat haastaviin tilanteisiin, heidän tulisi suhtautua asioihin myötätuntoisesti, säädellä tunteitaan ja vaalia läheisiä ja kannustavia suhteita oppilaisiin. Lisäksi heidän tulisi pidättäytyä käyttämästä tunteiden tukahduttamista strategiana tunteiden säätelyssä, vaan tämän sijaan uudelleenarvioida haastavia tilanteita tehdessään niistä tulkintoja opetustilanteissa. Kun opettajat kokevat tarvetta ilmaista kielteisiä tuntemuksia, ei maltin menettämistä eikä tunteiden tukahduttamista voi suositella, sillä ongelmasta keskustelu oppilaiden kanssa osoittautui hyödyllisemmäksi. Tämän lisäksi varmistui, että opettajien uskomukset rooleistaan, opettajan ja oppilaiden välisistä valtasuhteista, ammatillisesta etäisyydestä ja kielteisten tunteiden ilmaisusta ovat aiheita, joista voidaan perustellusti keskustella itsemääräämisteoriana käsittelevän kirjallisuuden (Self-Determination Theory, itsemääräämisteoriat) valossa niiltä osin kuin se liittyy autonomiaan, osaamiseen ja yhteenkuuluvuuteen kannustamiseen. Näin ollen tässä väitöstutkimuksessa katsotaan, että kun tutkitaan opettajien tunnekokemuksia ja heidän tapojaan ja menetelmiään tukea oppilaiden psykologisia tarpeita, olisi tärkeää sisällyttää tarkasteluun myös opettajien uskomukset. Lisäksi havaittiin, että koska autonomiaan kannustaminen ja kontrolli ovat luonteeltaan monimutkaisia, opettajien tulisi tarkastella itsereflektiivisesti motivointikäytäntöjään, jotta he voivat tunnistaa näiden käytäntöjensä vaikutuksia suhteessa oppilaiden oppimiseen ja hyvinvointiin.

Tässä väitöstutkimuksessa vahvistettiin, että oli hyödyllistä kerätä systemaattisesti analysoitua kvantitatiivisen tutkimuksen (oppilaille teetetyt kyselytutkimukset, joissa he ilmaisivat näkemyksiään opettajan tunnetiloista) dataa ja samanaikaisesti tarkastella opettajien omia uskomuksia tunnesäätelyn strategioista opiskelijoiden

havaintojen valossa. Samoin vahvistettiin, että on tärkeää käyttää teemahaastatteluja, jotta voidaan tarkastella opettajien uskomuksia ja tunneilmaisuja, ja on myös keskeistä kerätä tietoja opettajien näkemyksistä opettajien omista raporteista liittyen tunne- ja opetuskokemuksiin opetuksen aikana. Lisäksi autonomiaan kannustamista ja kontrollia tutkittiin videoanalyysien avulla, mikä auttoi paikantamaan, että uusien hyödyllisten kategorioiden löytäminen (kuten esimerkiksi tämän tutkimuksen yhteydessä löydetty virhetoleranssi) on hyödyllistä tähän aiheeseen liittyen.

Asiasanat: opettajien tunteet, oppilaiden havainnot, tunteiden säätely, tunteiden ilmaisu, autonomiaan kannustaminen, osaamisen tukeminen, yhteenkuuluvuuden edistäminen, kontrolli opetuksessa, opettajien uskomukset

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In Turku, August 2019

Jingwen Jiang

List of empirical studies

This doctoral thesis is based on the following three studies reported in three original articles. The studies are referred to in the text by their Roman numerals:

- Study I Jiang, J., Vauras, M., Volet, S., & Wang, Y. (2016). Teachers' emotions and emotion regulation strategies: Self- and students' perceptions. *Teaching and Teacher Education, 54*, 22–31.
- Study II Jiang, J., Vauras, M., Volet, S., & Salo, A. (2019). Teacher beliefs and emotion expression in light of support for student psychological needs: A qualitative study. *Education Sciences, 9*(2), 68.
- Study III Jiang, J., Vauras, M., Volet, S., Salo, A., & Kajamies, A. (in review). Autonomy-supportive and controlling teaching in the classroom: A video-based case study.

1. Introduction

The start of this doctoral research was inspired by the classroom observation of a lesson in an international lower-secondary school in Finland, during the author's internship of her Master's studies. During that lesson, as observed, the teacher skillfully managed the classroom activities, efficiently interacted with the students, and successfully maintained a pleasant and warm atmosphere. Moreover, the students actively participated in classroom activities as if they were teachers. At the end of the lesson, some students even suggested that they should take a small test in the next lesson to consolidate what they had learned. The students' request for a test was amazing to the author, who had never experienced this type of request. Furthermore, the author was aware that the teacher's teaching techniques appeared "effortless". Therefore, this observed lesson triggered the author's curiosity to conduct research on teachers' support for students' learning. It is interesting and important to discover what efforts lie underneath the "effortless" teaching strategies that motivate students to learn autonomously.

This dissertation aimed to investigate the significance of and the associations between teachers' emotions and beliefs in the classroom and support for autonomy, competence, and relatedness. Teachers' emotions play a crucial role in teaching and learning (Chang, 2009; Frenzel et al., 2016; Hamre & Pianta, 2005; Hargreaves, 2001; Turner, Meyer, & Schweinle, 2003). For example, recurring teachers' positive emotions are associated with high-quality teaching, whereas recurring teachers' negative emotions negatively affect students' learning outcomes (Frenzel, Goetz, Stephens, & Jacob, 2009). Negative emotions during teaching, such as anger and frustration, are frequently reported by teachers (Sutton & Wheatley, 2003). However, teachers' emotion expression may be different from their emotional experience because teachers may modify how they express an experienced emotion via emotion regulation (Gross, 1998a; 2002). Researchers are only beginning to investigate teachers' emotion regulation (Sutton & Harper, 2009). Failure to understand teachers' emotion regulation has been found to cause teachers' burnout and emotional exhaustion (Carson, 2007). In this regard, an investigation into teachers' emotion regulation is in urgent need.

Interestingly, students' observations of teachers' emotions were found to be very accurate (Rudduck & Flutter, 2004; Sutton & Wheatley, 2003). Therefore, it seems important to investigate teachers' emotion regulation in light of students' perceptions of teachers' emotions. Furthermore, regarding emotion expression, extreme and aggressive ways of expressing anger, such as yelling, were perceived as inappropriate by students, while discussing anger with students was perceived to be acceptable (McPherson, Kearney, & Plax, 2003). Consequently, it is important to help teachers understand the effective uses of emotion regulation and how they can express negative emotions appropriately.

Studies have also shown that teachers with autonomy-supportive teaching styles experience less emotional exhaustion and more positive emotions than those with controlling teaching (e.g., Roth, Assor, Kanat-Maymon, & Kaplan, 2007; Trigwell, 2012). This finding pinpointed that teachers' support for students' psychological needs—autonomy, competence, and relatedness (Deci & Ryan, 1985; Ryan & Deci, 2000)—is connected with teacher emotional experience. In addition to teachers' emotions, teachers' beliefs have also been found to be associated with their support for autonomy (Reeve et al., 2014), competence (Warfield, Wood, & Lehman, 2005), and relatedness (O'Connor, 2008). Furthermore, it has been posited that teachers' beliefs are also tightly connected to emotional experiences and emotion expressions (Chang, 2009). Therefore, teachers' support for students' psychological needs, teachers' emotions, and beliefs appear to be intercorrelated. However, to our knowledge, there is a lack of empirical research that simultaneously examines the significance of, and the relationship between, these variables. We addressed this research gap and our research focus in depth. This dissertation explored teachers' emotional experience, emotion regulation, emotion expression, controlling teaching, teachers' beliefs, and support for autonomy, competence, and relatedness as part of the the relationship between these prominent constructs of classroom practice.

1.1. Teachers' emotions

1.1.1. Teachers' emotional experience

Emotional experience is grounded in appraisal theory, which posits that emotions are responses to evaluations or appraisals of events, rather than events themselves (Lazarus, 1991; Smith & Lazarus, 1990). In primary appraisal, people evaluate whether the situation is relevant or important to their needs or well-being, and whether the situation is consistent with their goals. Thus, relevance and goal congruence are the most important elements in the significance of an emotional stimulus (Lazarus, 1991). It was argued by Chang (2009) that in the classroom context, the more a teacher cares about his or her students, the more likely an emotional encounter will be judged as important. For example, a student's disruptive behaviors might threaten a teacher's goal achievement if the teacher's goal is to teach students academic skills. Consequently, according to Chang, teacher-student relationships and goal congruence are important components in teachers' primary appraisals and contribute greatly to teachers' daily emotional experiences. Appraisal theory explains why the same classroom event elicits different emotions in individual teachers and why individual teachers experience different emotions in response to the same student behavior (Sutton & Wheatley, 2003).

Teachers experience positive (pleasant) and negative (unpleasant) emotions in general, as well as discrete emotions (e.g., enjoyment, anger, and anxiety) in everyday teaching (Frenzel et al., 2016; Frenzel et al., 2009). Empirical evidence has demonstrated that the discrete emotions teachers frequently experience include enjoyment (happiness), enthusiasm (inspiration), warmth (friendliness), affection,

caring, anger, anxiety (worry/nervousness), frustration (annoyance), and fatigue (tiredness) (Kunter, Frenzel, Nagy, Baumert, & Pekrun, 2011; Oplatka & Eizenberg, 2007; Sutton, 2007; Sutton & Wheatley 2003; Zembylas, 2005a). Other discrete emotions, such as relaxation (calmness), pride (confidence), distractedness, and indifference have also been found useful in discerning teachers' emotions, although less frequently experienced (Chang, 2009; Sutton & Wheatley, 2003).

In addition to positive and negative emotions as well as discrete emotions teachers experience frequently, teachers' trait and state emotions have also attracted extensive attention. Trait emotions refer to teachers' propensity to experience a particular discrete emotion and are assumed to be relatively stable over time and across situations; state emotions, on the other hand, refer to the situation-specific emotional state which is dependent on contextual conditions (Spielberger, 2010). In other words, trait emotions are more connected with teachers' attributes while state emotions are more dependent on teaching contexts. Since teachers experience various situations in a particular class or from class to class in everyday teaching, the intra-individual variations of teachers' emotional experiences, i.e., teachers' state emotions in the classroom, call for more research attention.

1.1.2. Teachers' emotion regulation

Despite the negative emotions teachers experience in everyday teaching, teachers may modify how they feel via emotion regulation. From the perspective of social psychology, Gross (1998a) defined emotion regulation as "the processes by which individuals consciously or unconsciously influence which emotions they have, when they have them, and how they experience and express them." Gross (1998a, 1998b) also distinguished between two broad classes of emotion regulation: antecedent-focused emotion regulation, which occurs before emotions are generated, and response-focused emotion regulation, which occurs after response tendencies are triggered. According to Gross (1998a, 1998b), antecedent-focused emotion regulation includes situation selection, which refers to approaching or avoiding certain people or situations to modify their emotional impact; situation modification, which involves directly changing a situation to regulate emotions; attention deployment, in which individuals focus attention on or move attention away from a situation to change the influence of the situation on individuals' emotions; and cognitive change, which refers to modifying one's evaluations of a situation or one's ability to manipulate a situation in order to alter its emotional impact. Response-focused emotion regulation involves modifying the physiological, experiential, or behavioral response after an emotion has been generated. The effects of these two broad classes of emotion regulation were also discussed by Gross.

Gross (1998b) speculated that antecedent-focused emotion regulation (e.g., reappraisal) might be better than response-focused emotion regulation (e.g., suppression) in consideration of individuals' physical and psychological health. This assumption is because, according to Lazarus and Alfert (1964) (also see Lazarus &

Folkman, 1984), reappraisal is a way to reinterpret the meaning of an emotional stimulus to alter its emotional impact, whereas suppression is defined as the inhibition of ongoing emotion-expressive behavior (Gross & Levenson, 1993; Gross, 1998b). Also, reappraisal affects the emotion response tendencies early in the emotion-generative process (Gross & John, 2003). It is important to note that Gross (1998b) also carried out an experiment to identify the influences of reappraisal and suppression on emotional expression and experience. In this experiment, undergraduate participants were assigned to either a reappraisal or a suppression condition when watching a negative emotion-eliciting film. Gross found that reappraisal led to an increase in both the experience and expression of positive emotion and was effective in reducing both the experience and expression of negative emotion. Another finding in this experiment was that suppression occurred after the emotion response tendencies had been generated, and thus reduced the expression of negative emotion to some extent. However, suppression was ineffective in relieving the experience of negative emotion and might have prevented the expression of positive emotion.

Gross's model of emotion regulation has had a strong influence on research into teachers' emotion regulation (e.g., Hagenauer & Volet, 2014; Gong, Chai, Duan, Zhong, & Jiao, 2013; Sutton, 2004; Sutton, Mudrey-Camino, & Knight, 2009). The categories of emotion regulation in Gross's model have guided educational researchers' classification of emotion regulation strategies in teaching. For example, Sutton (2004) found that teachers employed various preventive strategies (antecedent-focused), such as making the whole class work quietly, thinking of positive aspects, diverting attention, using self-talk, and responsive strategies (response-focused), such as taking a deep breath and controlling facial expressions to regulate their emotions. In addition, Gong and colleagues (2013) reported that in the interviews, teachers used situation selection (e.g., walking to another group), situation modification (e.g., telling a joke), attention deployment (e.g., neglecting a situation), cognitive change (e.g., thinking of the positive side of a thing) and response modulation (e.g., hiding the feeling inside) as their emotion regulation strategies.

Another proposal related to emotion regulation during teaching is the distinction between up-regulating and down-regulating emotions (Sutton & Harper, 2009), which was expanded based on Gross's (1998a) assumption that both positive and negative emotions could be regulated. Sutton and Harper defined up-regulating as an attempt to increase the intensity or duration of the emotion experience. They argued that teachers might up-regulate a positive emotion, such as joy or enthusiasm, in order to communicate positively with students; teachers may also up-regulate a negative emotion like anger to educate the students not to break the rules. In turn, Sutton and Harper defined down-regulating as attempts to decrease the emotion experience. They also argued that teachers frequently down-regulate their negative emotions, such as anger, to maintain classroom management and develop positive

relationships with students. However, as noted by Sutton et al. (2009), recent research has drawn more attention to down-regulating negative emotions than up-regulating positive emotions.

1.1.3. Teachers' emotion expression

Emotion expression is a dimension of emotion regulation (Gross 1998a, 2002) and may be part of the process or outcome of emotion regulation. Emotion expression may occur during or after individuals consciously or unconsciously influence how emotion is experienced and expressed. In other words, teacher expression of emotion may be different from the emotion that is actually experienced by the teacher because of emotion regulation.

The expression of emotions involves verbal and nonverbal domains; verbal display refers to utterances or languages (Fussell, 2002), and nonverbal display includes voice, intonation, posture, gesture, body movement, and facial expression (Dael, Mortillaro, & Scherer, 2012). It has been reported that teachers express their positive emotions by verbally addressing their positive emotional state ("I am really excited that..."), and by praising students ("I am proud that ...") (Hagenauer & Volet, 2014); teachers express their negative emotions (e.g., anger) by criticizing students or discussing their anger with them (McPherson, Kearney, & Plax, 2003). It has also been found that teachers display their joy nonverbally by hugging students (Hagenauer & Volet, 2014), and their anger by hitting the desk or raising their voice (Hosotani & Imai-Matsumura, 2011).

Patterns of teachers' emotion expression, supported by empirical evidence, include natural expression, direct staging, suppression, and faking (Hagenauer & Volet, 2014; Gong et al., 2013; Hosotani & Imai-Matsumura, 2011; Taxer & Frenzel, 2015). First, natural expression or genuine expression refers to sincere and spontaneous responses to an emotion-eliciting situation without trying to regulate (alter or hide) an experienced emotion; this process occurs naturally, sometimes even without being noticed by individuals themselves who are expressing an emotion (Salmela, 2005). Natural expression has been reported by teachers who value authenticity without role play (Hagenauer & Volet, 2014). Second, direct staging involves consciously or intentionally expressing an emotion after decreasing the emotional experience (down-regulating) of an undesirable emotion or increasing the intensity (up-regulating) of a desirable emotion (Hosotani & Imai-Matsumura, 2011; Sutton & Harper, 2009). Teachers have been found to direct-stage their joy by consciously dramatizing words or making joyful facial expressions, even if they are not experiencing significant joy (Hosotani & Imai-Matsumura, 2011). Third, suppression is defined as the inhibition of emotion expression, such as hiding an experienced emotion or masking a negative emotion with a positive one (Gross, 1998b). Teachers have reported suppressing anger to maintain their authority in front of students (Jiang, Vauras, Volet, & Wang, 2016). Fourth, faking is defined as intentionally expressing an unfeared emotion (Pugmire, 1998). Happiness, liking,

enthusiasm, and pride are the most frequently faked emotions during teaching (Taxer & Frenzel, 2015). Faking sadness has also been reported by teachers after students' failure to follow a class rule instead of directly rejecting students' misbehavior (Hosotani & Imai-Matsumura, 2011).

1.1.4. Students' perceptions of teachers' emotions

Even if teachers try to fake their emotions, students can still know when teachers are not themselves through observations of teachers' vocal changes, such as pitch, and physiological changes, such as facial expressions and body language (Sutton & Wheatley, 2003). Furthermore, a series of ground-breaking projects, by Rudduck and Flutter in the UK, ongoing since the 1990s (e.g., Rudduck, Chaplain, & Wallace, 1996; Rudduck & Flutter, 2004), have provided empirical evidence that students' perceptions of the teaching and learning processes tend to be very astute. The astuteness of students' perceptions implied that teachers might gain new insights into teaching, learning, and schooling from the perspectives of their students. Despite justification for students' voices from studies like Rudduck's, and evidence from Sutton and Wheatley that students can be aware of their teachers' emotions through observation, there is a lack of studies on students' perceptions of their teachers' emotions. Furthermore, empirical research by Gross and John (2003) in social psychology has foregrounded our assumption that students' perceptions of teachers' emotions tend to be important in exploring teachers' emotion regulation strategies. In addition to justifying the rationale behind the focus on students' perceptions, it is significant to pinpoint an important methodological gap.

To the best of our knowledge, earlier research involving students' perceptions of their teachers' emotions has often investigated how teachers' emotions influence them, mainly obtained from interview data. For example, Thomas and Montgomery's (1998) interviews of elementary school students revealed that teachers' yelling hurt their feelings; in the study by Perry, VandeKamp, Mercer, and Norby (2002), primary school students reported that they were aware of their teacher's unhappiness when they were making mistakes; and, in a study by Phelan, Davidson, and Cao (1992), high school students indicated that teachers who were perceived as caring would win their students' cooperation, while those who were seen as not caring would not motivate the low-achieving students to complete schoolwork willingly. In addition to the abovementioned lack of recent studies on students' perceptions of their teachers' emotions in general, there is an almost total lack of studies employing quantitative methods. Consequently, in order to address this research gap and test the reliability and validity of quantitative methods in this type of research, this dissertation used questionnaires to examine students' perceptions of their teachers' emotions.

1.2. Teachers' support for students' psychological needs

1.2.1. Autonomy, competence, and relatedness support

As stressed at the beginning of the introduction, teachers' support for autonomy, competence, and relatedness is assumed to be connected to teachers' emotions. Self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000) posits that self-determined or autonomous motivation—that is, the inherent tendency to seek out enjoyment and inner resources for self-regulated actions—is sustained by the satisfaction of the three fundamental psychological needs: autonomy, competence, and relatedness. The need for autonomy refers to the desire of individuals to control their own behaviors. The need for competence represents individuals' propensity to interact effectively with their environments and display their capacities. The need for relatedness reflects the desire to feel connected with and accepted by significant others. SDT suggests that the satisfaction of these three needs facilitates self-determined motivation and psychological well-being, but dissatisfaction leads to diminished motivation and increased mental ill-being.

SDT, as applied to educational practice, postulates that teachers' support of students' psychological needs for autonomy, competence, and relatedness includes multiple teaching strategies. Autonomy support refers to promotion of students' experiences of volition and psychological freedom, such as providing choice, encouraging self-initiation, fostering interests, providing explanatory rationales, using non-controlling language, and acknowledging students' perspectives and feelings (Assor, Kaplan, & Roth, 2002; Jang, Reeve, & Deci, 2010; Reeve, 2009; Reeve et al., 2014). Competence support (structure) involves fostering students' sense of effectiveness to expand their academic capabilities and achieve desired outcomes, such as providing optimal challenges, competence-affirming feedback, and clear expectations (Jang et al., 2010; Niemiec & Ryan, 2009; Reeve & Jang, 2006). Relatedness support (involvement) represents developing positive and mutually satisfying relationships with students, such as showing affection, warmth, caring, and respect to students and displaying interest in their activities (Bieg, Rickelman, Jones, & Mittag, 2013; Martin & Dowson, 2009; Niemiec & Ryan, 2009).

Overall, a large corpus of empirical evidence based on SDT suggests that teachers' autonomy, competence, and relatedness support is associated with students' interest in schooling (Wentzel, Battle, Russell, & Looney, 2010), self-efficacy beliefs (Ryan & Patrick, 2001), goal pursuit (Wentzel, Baker, & Russell, 2012), engagement (Benita, Roth, & Deci, 2014), academic performance, and well-being (for a review, see Niemiec & Ryan, 2009). Specifically, teachers' autonomy support is connected with students' preference for optimal challenge, conceptual understanding, grades, and psychological well-being (Reeve, 2009). In addition, teachers' competence support is related to students' perceptions of their competence, perceived control over learning outcomes, and self-regulated learning strategies (Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009). Moreover, teachers' relatedness support is linked to students' self-efficacy, success expectations, achievement values, positive affect, effort, and task goal orientation (Furrer & Skinner, 2003).

The relation between autonomy, competence, and relatedness support has been found to be affected by an autonomy-supportive versus controlling style (Jang et al., 2010; Ryan & Deci, 2000; Sierens et al., 2009). Competence or relatedness support can be provided with freedom and encouragement (i.e., autonomy-supportive) or pressure and coercion (i.e., controlling) (Jang et al., 2010; Ryan & Deci, 2000). If competence support is combined with a controlling style (e.g., rewards or threats), the context may yield external regulation (to comply with external pressuring demands). If relatedness support is combined with a controlling style (e.g., guilt induction), the context may yield introjected regulation (to avoid internally pressuring feelings of guilt and shame). Only if competence or relatedness support is provided in an autonomy-supportive manner can the context support autonomous motivation (being self-governed and acting from the self) (Ryan & Deci, 2000). Consequently, competence support has been found to be associated with self-regulated learning only under conditions of moderate or high autonomy support, rather than low autonomy support and high control (Sierens et al., 2009). In general, autonomy support emerges as the most critical factor in sustaining autonomous motivation because autonomy support also facilitates satisfaction of the needs for autonomy, competence, and relatedness (Ryan & Deci, 2000). To sum up, in an educational setting, competence or relatedness support alone, with little or no autonomy support for students, cannot foster their autonomous motivation and self-regulated learning. Therefore, it is important to explore the elements of autonomy support in greater depth.

1.2.2. Autonomy support versus controlling teaching

Autonomy support refers to what a person says and does to enhance another's internal perceived locus of causality (the idea that action originates from and is regulated by the self), which relates to a sense of psychological freedom and choice (Reeve, Nix, & Hamm, 2003; Ryan & Deci, 2000). Also, autonomy support in the classroom refers to the integration of students' perspectives, including personal interests, preferences, intrinsic goals, and self-endorsed values in classroom activities (Assor et al., 2002; Reeve, 2009; Reeve et al., 2014). The elements of instructional strategies that concern autonomy support have been identified, based on various operational definitions. For example, in laboratory experiments (Deci, Eghrari, Patrick, & Leone, 1994) and empirical research (Assor et al., 2002; Williams, Cox, Kouides, & Deci, 1999), where autonomy support was focused on enhancing the internal perceived locus of causality, four important elements of autonomy support were identified: (1) providing explanatory rationales, (2) acknowledging negative affect, (3) using non-controlling language, and (4) offering choices. When the definition of autonomy support was expanded to nurturing students' psychological needs (autonomy, competence, and relatedness) at a broad level, a fifth element (nurturing inner motivational resources) was added (Reeve, Deci, & Ryan, 2004). At least four of these five categories were included in the design of

most (sixteen out of nineteen) intervention programs, according to a meta-analysis of the effectiveness of intervention in supporting autonomy (Su & Reeve, 2011).

In contrast, controlling teaching is closely associated with controlled motivation, which includes external and introjected regulations (Ryan & Deci, 2000). External regulation (e.g., rewards and punishments) comes from contingent consequences administered by others, whereas introjected regulation (e.g., self-esteem or threats of guilt and shame) comes from contingent consequences that are self-administered (Deci, Ryan, & Williams, 1996; Grolnick, Deci, & Ryan, 1997; Ryan & Deci, 2000). Although introjected regulation is within the person, it is still relatively external to the self because this regulation is experienced without internal self-endorsement but with internal control to avoid guilt or shame or to gain approval from others (Deci et al., 1996).

Controlling teaching, therefore, includes direct (external) (Assor, Kaplan, Kanat-Maymon, & Roth, 2005) and indirect (internal) (Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005) types. Direct controlling teaching involves explicit attempts to change students' behaviors or thoughts fully and instantly: for example, by imposing deadlines, surveillance, giving directives, rewards, or threats of punishment so that students are motivated by external regulation (Assor et al., 2005; Reeve, 2009). Indirect controlling teaching entails subtle or covert attempts to cause feelings of shame, guilt, and anxiety by linking students' behaviors with their self-esteem, providing contingent affection, or threatening to withdraw attention or approval, so that students are motivated by introjected regulation (e.g., "Good boys always listen to their teachers") (Assor, Roth, & Deci, 2004; Deci, & Ryan, 2000; Vansteenkiste et al., 2005). In general, controlling teaching refers to tactics teachers use to pressure students to think, feel, or behave in a teacher-prescribed way without considering students' perspectives (Reeve et al., 2014; Soenens, Sierens, Vansteenkiste, Dochy, & Goossens, 2012). The categories of direct control include *relying on outer sources*, *using controlling language*, and *rejecting negative affect* (e.g., De Meyer, Soenens, Aelterman, & Haerens, 2016; Deci, Ryan, & Williams, 1996; Reeve, 2009). The elements of indirect control involve *creating ego-involvement*, and *conditional regard* (Assor et al., 2004; Vansteenkiste et al., 2005).

1.2.3. Qualitative video-based observation of autonomy support and control

Major ways of exploring teachers' autonomy support or control in the literature include students' reports, teachers' reports, experiments, and observations. Although each method has its pros and cons, observations (in particular, qualitative video-based observations) complement the other measurements with the following advantages. First, observations (e.g., Andersen & Nielsen, 2013) provide a more informative understanding of teaching strategies compared to students' reports (e.g., Assor et al., 2002), which assess only overall students' perceptions of teaching styles. Second, observations (in particular, video-based) have higher validity than teachers' reports, because teachers do not always report their actual teaching

practices (Mosston & Ashworth, 2002). Video-based observations of real classroom episodes, therefore, can address this problem by using repetitive observations by raters or coders. Third, observations have higher validity than experiments because the former is based on real classroom settings, while the latter relies on the design of conditions. For example, Furtak and Kunter's (2012) experiment found that students felt controlled by conditions intended to be autonomy-supportive. This finding highlighted possible discrepancies between the expectations and outcomes of experimental conditions. Fourth, qualitative video-based observations can provide vivid and concrete illustrations of teacher-student interactions that quantitative records of observations cannot, because in the latter (e.g., Haerens et al., 2013), raters must determine and record the frequency or level of teaching strategies rather than investigate specific examples of teaching strategies. In sum, qualitative video-based observations surpass students' reports, teachers' reports, experiments, along with quantitative observations regarding validity and in-depth investigation in research into teachers' autonomy support and control, and therefore lead to valuable insights into these important teaching strategies.

1.3. Teachers' beliefs

In addition to the relation between teachers' support for students' psychological needs and teachers' emotions, teachers' beliefs may play a significant role in their autonomy support (Reeve et al., 2014) and may influence teachers' emotional experience and emotion expression (Chang, 2009). Therefore, it is important to include teachers' beliefs when investigating teachers' support for students' psychological needs and teachers' emotions. Beliefs are defined as conceptions, personal ideologies, and values that impact practice and shape knowledge (Thompson, 1992). The most outstanding distinction between beliefs and knowledge is that beliefs are typically accepted to be true by individuals who hold them, while knowledge is not necessarily believed (Calderhead, 1996). Teachers' beliefs are considered to be greatly influential in their setting of goals and their teaching practices or pedagogical decisions in the long run (Cross & Hong, 2012; Woolfolk-Hoy, Hoy, & Davis, 2009).

A number of studies have examined teachers' beliefs about teaching and learning in general, about subject matter, self-efficacy, identity, and teaching roles (e.g., Cross & Hong, 2012; Kitching, 2009; Tsouloupas, Carson, Matthews, Grawitch, & Barber, 2010; Van Driel, Bulte, & Verloop, 2007). Pajares (1992) recommends that teachers' beliefs be narrowed further to specify their meanings; for instance, teachers' beliefs about their roles as friends, protectors, mentors, carers, controllers, or gatekeepers, among others (Davis, 2001; Kitching, 2009). Educational research has shed light on relationships between teachers' beliefs and their support for students' psychological needs, such as autonomy support (e.g., Reeve et al., 2014), and teachers' emotions (e.g., Chang, 2009).

Previous research has focused on the relationship between teachers' emotions and their beliefs about their identity. For example, the ways teachers regulate their negative emotions such as disappointment and frustration are deeply connected with their pedagogical beliefs and their well-developed professional identity (Cross & Hong, 2012). On the other hand, teachers' negative emotional displays and internal experiences help to constitute teacher's identity and teaching roles (Kitching, 2009). Therefore, teachers' beliefs about their identity and teaching roles are deemed to be valuable in the investigation of teachers' emotions. Moreover, although most previous studies have not directly addressed teachers' beliefs, some have discussed the association between teacher-student relationships and teachers' emotions. For example, how teacher-student power relations (e.g. authority) (Zembylas, 2005b) and teachers' professional distance (e.g. being close to students) (Hargreaves, 2001) can be related to teachers' emotional displays. Therefore, teachers' beliefs or conceptions about teacher-student relationships are also valuable in the exploration of teachers' emotions.

Regarding the investigation into teacher beliefs, quantitative questionnaires or inventories (e.g., Isikoglu, Basturk, & Karaca, 2009) as well as qualitative interviews (e.g., O'Connor, 2008) have been used. However, questionnaires have been criticized as too restricted in scope and not validly representing teachers' beliefs (Richardson, 1996). In addition, some questionnaires to assess teachers' beliefs may fall into a self-fulfilling prophecy, in which researchers' expectations are built into the instrument so that participants are likely to fulfill those expectations as they answer the survey (Kane, Sandetto, & Heath, 2002). In contrast, interviews enable participants to reflect on their teaching experiences and therefore offer opportunities to investigate their beliefs and values (e.g., O'Connor, 2008). Therefore, compared to questionnaires, interviews enable researchers to focus on an exploratory or interpretive paradigm and to provide in-depth and reflective insights into teachers' self-understanding of the teaching process.

1.4. Relationship between teachers' beliefs, need support, and emotions

It is important to note that SDT researchers tend to label support for autonomy, competence, and relatedness as need support (e.g., Sheldon & Filak, 2008; Standage, Duda, & Ntoumanis, 2005). The relationship between teachers' beliefs and teaching practices have attracted researchers' attention, but these relations have seldom been discussed from the perspective of need support. Reeve and colleagues (2014) argued that teachers' beliefs about the effectiveness of autonomy-supportive versus controlling teaching styles are connected with teachers' preference for either style. Woolfolk, Rosoff, and Hoy (1990) found that teachers with beliefs about students' untrustworthiness are more likely to employ extrinsic rewards to motivate students (low or no autonomy support). O'Connor (2008) found that teachers' beliefs about teaching roles are associated with their caring for students (relatedness support). Moreover, Warfield and colleagues (2005) found that teachers' beliefs about students as autonomous learners are more likely to employ inquiry

pedagogies in which students are encouraged to offer different solution methods, ask questions, and give clarification and reasoning for their thinking process (both autonomy and competence support).

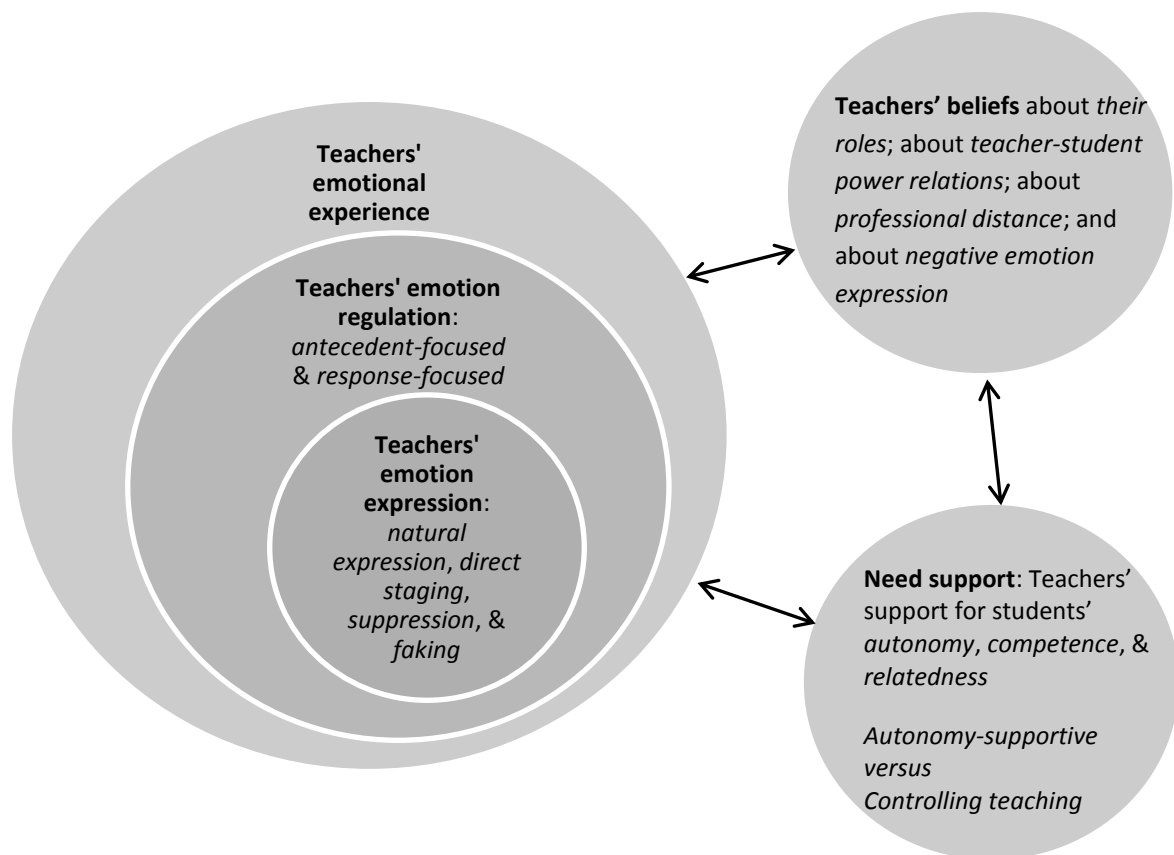
The relationship between teachers' beliefs and emotions is grounded in appraisals of emotions. Appraisal theory (Lazarus, 1991) postulates that the experience of an emotion depends on the interpretation of its stimulus, and goal congruence or incongruence affects whether an emotion is triggered. For example, Chang (2009) argued that one teacher might feel threatened by disruptive student behavior while another teacher may not be affected by the same behavior, partially because teachers' beliefs and goals mediate their own emotional experience processes. Furthermore, teachers' beliefs are also associated with their emotion expression. Zembylas (2005b) argued that teachers' beliefs about teacher-student power relations or teachers' roles shape their emotion expression for example, by permitting some emotions to show while prohibiting others. Interestingly, Jiang and colleagues (2016) found that teachers' beliefs about authority are related to suppression of anger.

Finally, the relation between teachers' need support and emotions is informed by the term "emotional support" (Ruzek et al., 2016), which refers to teachers' displays of genuine care about their students, respect for them, and willingness to understand them. The three constructs of emotional support include emotional positive climate (e.g., positive feedback), teachers' sensitivity (e.g., caring for student difficulties), and regard for students' perspectives (e.g., acknowledging negative feelings), which reflect teachers' support for students' competence, relatedness, and autonomy, respectively (Niemic & Ryan, 2009). Therefore, the concept of emotional support indicates that teachers' need support is interwoven with their emotions. Empirical studies have also found that teachers with high autonomy support experience less emotional exhaustion and more positive emotions than those with low autonomy support or controlling teaching (e.g., Roth et al., 2007; Trigwell, 2012).

In sum, teachers' beliefs have a great impact on and are intertwined with teachers' need support and emotions (see Figure 1). This conceptualization provides the theoretical backbone for this dissertation. Nevertheless, to our knowledge, there is a lack of empirical research that simultaneously investigates the essence of and the relationship between these variables. To address this research gap, three in-depth case studies were conducted, which were connected with each other theoretically and empirically. Study I investigated the relationship between teachers' emotion regulation strategies and students' perceptions of their teachers' emotions. This study provided insightful knowledge of teachers' emotions and emotion regulation strategies for the second study that involved teachers' emotion expression. Study II explored teachers' beliefs and emotion expression and to discuss the findings in light of teachers' support for autonomy, competence, and relatedness. This study deeply connected teachers' beliefs, emotions, and need support, and also provided insights into autonomy-supportive teaching for the third study. Study III explored teachers'

autonomy-supportive and controlling behaviors in teaching contexts, and shed light on the instructional strategies pertaining to teachers' support for students' autonomy.

Figure 1. Relationship between teachers' emotions, beliefs, and need support



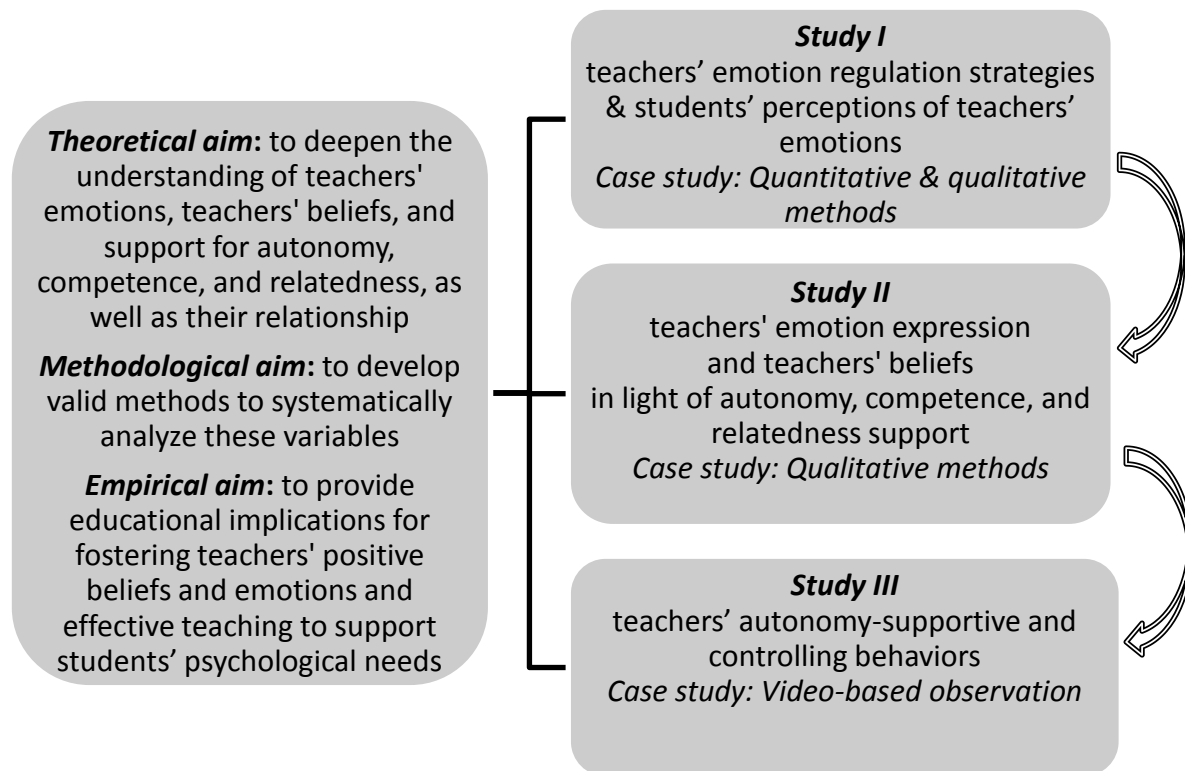
2. Aims and structure of the studies

This dissertation focused on three general aims. First, the theoretical aim was to deepen the understanding of teachers' emotions, teachers' beliefs, and support for autonomy, competence, and relatedness, as well as their relationship. Second, the methodological aim was to develop valid methods to analyze these variables systematically. Third, the empirical aim was to provide educational implications for fostering teachers' positive emotions and effective teaching strategies to support students' psychological needs.

The specific aims of the three studies, as shown in Figure 2, were combined to achieve the general aims. Study I aimed to investigate teachers' emotion regulation strategies and relate them to students' perceptions of their teachers' emotions. This study deepened our understanding of teachers' emotions and provided a solid foundation for the second study. Study II aimed to explore teachers' beliefs and emotion expression based on teachers' interviews and to discuss the findings in light of SDT regarding teachers' support for autonomy, competence, and relatedness. This study also provided insights into autonomy-supportive teaching for the third study. Study III aimed to explore teachers' autonomy-supportive and controlling behaviors. All three studies were in-depth case analyses, with mixed methods

combining student surveys and teacher interviews (Study I), semi-structured interviews with teachers (Study II), and video-based observation (Study III).

Figure 2. Overview of the aims of the dissertation



3. Methods

3.1. Participants

In *Study I*, the participants were comprised of 4 teachers and 53 students in Grades 7-9 from an international lower-secondary school in Finland. The four participating teachers (2 males and 2 females, 3 Finnish and 1 Canadian) were the subject teachers of math, English, history, and biology. Except for the English teacher, the math, history, and biology teachers were the form teachers of Grades 7, 8, and 9, respectively, who had more contact with the class for which they were responsible than the other subject teachers. The years of teaching experience of the math teacher, English teacher, history teacher, and biology teacher were 2, 22, 6, and 15, respectively. The student sample consisted of 3 classes with 16 students from Grade 7, 19 students from Grade 8, and 18 students from Grade 9. Their ages ranged from 12 to 16 years ($M=14.3$ years, $SD=1.0$), with 52.8% girls and 47.2% boys. It is important to note that 47.2% of the students were Finnish, and the rest were international.

In *Study II*, the participants were comprised of six teachers in Grades 7 and 9 from a multicultural school in Finland. There were three males and three females, of whom

five were Finnish, and one was North American. The participating teachers taught math and English, and their years of teaching experience ranged from three to thirty. Four were only subject teachers, while two were both subject and homeroom teachers. These two homeroom teachers had more responsibilities than other teachers regarding students' presence and safety at school, as well as contact with parents.

In *Study III*, the two participating teachers, with the pseudonyms of Anne and Laura, were from a secondary school in southwestern Finland. Anne and Laura gave their consent for video observations of their classes. Anne, whose teaching experience spanned thirty years, was the Finnish subject teacher of classes 7B and 8B; Laura, whose teaching experience covered five years, was the English subject teacher of classes 7C and 8C. Both teachers helped students with their academic achievement in the subject they taught. In addition to her role as a subject teacher, Laura was also the homeroom teacher of class 8C. The role of a homeroom teacher in the Finnish context is to take broader responsibility for a class of students, including accountability for their attendance, well-being, and safety, and acting as the contact person for parents.

All three studies were conducted in middle schools. The reasons why middle school students and teachers were selected as participants include the following: (1) Teenagers are assumed to be mature enough to form their independent opinions about the learning environment; (2) Teenagers are more sensitive to their identity and need for autonomy due to their hormonal and physical changes; (3) Emotional interactions between teenagers and their teachers are greatly significant for the growth of teenagers psychologically. Therefore, it is extremely important to investigate teachers' emotions, beliefs, and teaching strategies for educating and nurturing teenage students.

3.2. Students' surveys about their perceptions of teachers' emotions

In *Study I*, students' perceptions of their teachers' emotions were assessed by the eight-item questionnaire. The students rated the frequency of display of the teachers' emotions during teaching with a 5-point Likert-scale ranging from 1 (never) to 5 (always). The eight items ("happy," "inspired," "tender," "affectionate," "angry," "annoyed," "nervous," and "distracted") were only emotion adjectives based on positive emotions, such as joy, excitement, warmth, affection, and on negative emotions that included anger, frustration, and anxiety, which teachers report experiencing frequently (Emmer, 1994; Godar, 1990; Hargreaves, 1998; Oplatka & Eizenberg, 2007; Sutton & Wheatley, 2003).

3.3. Teachers' interviews

3.3.1. Teachers' emotion regulation strategies

In *Study I*, the participating teachers were invited to take part in semi-structured interviews and reflect on their emotional experiences and emotion regulation strategies during the lessons in a specific class. They were given a list of eight emotion adjectives that were the same as the eight items in the students' questionnaires ("happy," "inspired," "tender," "affectionate," "angry," "annoyed," "nervous" and "distracted"). This design made it easier to explore how these teachers regulated their emotions, the display of which their students were invited to evaluate. However, the main function of the emotion list was only to prompt the teachers to think about their emotion regulation strategies. It was made explicit to the teachers that they were welcome to discuss their experiences of other emotions in addition to those in the list. The core questions of the semi-structured interviews shown below were adapted from those used in the study of Sutton (2004).

- 1) Which emotions in the list do you often experience when teaching Class X? (List: Happy, Inspired, Tender, Affectionate, Angry, Annoyed, Nervous, and Distracted)
- 2) Do you ever try to control, regulate, or mask your emotional experiences when teaching this class?
- 3) How do you increase your positive emotion, such as...when teaching this class?
- 4) How do you reduce your negative emotion, such as...when teaching this class?
- 5) Why do you try to control, regulate, or mask your emotional experiences when teaching this class?

3.3.2. Teachers' emotion expression and beliefs

In *Study II*, the semi-structured interviews captured teachers' emotion expression and their beliefs. The teachers were first presented with a list of emotions, including calm, confident, affectionate, inspired, friendly, caring, relaxed, happy, nervous, annoyed, worried, tired, displeased, angry, distracted, and indifferent. These emotions have been shown to be experienced frequently by teachers or prominent in discerning teachers' emotions (e.g., Chang, 2009; Kunter et al., 2011; Sutton & Wheatley, 2003). The teachers were then asked to use the list to select the positive and negative emotions they experienced during teaching a particular class, and to reflect on their emotional experience and emotion expression while teaching that class. The core interview questions, shown below, were adapted from those used by Hagenauer & Volet (2014).

- 1) Which emotions in the list do you experience when teaching Class X? (The list included calm, confident, affectionate, inspired, friendly, caring, relaxed, happy, nervous, annoyed, worried, tired, displeased, angry, distracted, and indifferent.)
- 2) Do you show (or hide) them? How do you show (or hide) them?

3) Could you describe a situation in which you experienced and showed (or hid) an emotion? What happened at that time?

3.4. Video-based observation of autonomy support and control

In *Study III*, the four lessons were videotaped during regular teaching, using a digital camera. Since this study focused on teachers' instructional strategies, the camera was positioned at the back of the classroom facing the teacher. Because the students were seated in rows or small groups, only the backs or profiles of the students could be filmed unless they turned around or sat facing the camera. All verbal interactions in the videos were transcribed and subtitled in English for data analysis. Teachers' utterances (verbal) were analyzed, and their tones and gestures (nonverbal) were also interpreted by three educational researchers to investigate teachers' autonomy-supportive and controlling behaviors.

3.5. Analyses

3.5.1. Students' perceptions of teachers' emotions

In *Study I*, because the 7th graders filled in the questionnaires twice to provide their perceptions of emotional display of the math teacher and the English teacher, respectively, while the 8th graders evaluated emotional display of only the history teacher and the 9th graders of only the biology teacher, two datasets were generated. Both datasets consisted of the 53 students' perceptions, with Dataset 1 related to the math, history, and biology teachers, and Dataset 2 related to the English, history, and biology teachers.

The internal consistency for the 4-item subscale assessing positive emotions was very good in Dataset 1 ($\alpha=0.84$), and respectable in Dataset 2 ($\alpha=0.78$). The reliability of the 4 items assessing negative emotions was very good in Dataset 1 ($\alpha=0.85$) and acceptable in Dataset 2 ($\alpha=0.67$). In addition, Principal Component Analysis was conducted to test construct validity and extracted two components for the 8 items assessing positive and negative emotions. "Happy," "inspired," "tender," and "affectionate" had high loadings on Component 1, and these items measured positive emotions, whereas "angry," "annoyed," "nervous," and "distracted" had high loadings on Component 2, and these items measured negative emotions.

3.5.2. Teachers' emotion regulation strategies

In *Study I*, all interviews were audio-recorded and transcribed, and the analysis was conducted based on Gross's (1998a) process model of emotion regulation, which included situation selection, situation modification, attention deployment, cognitive change, and response modulation. Therefore, the deductive template approach (Crabtree & Miller, 1999) was employed to frame the data analysis, in which the coding categories were developed *a priori* on the basis of the research questions and the theoretical constructs. Several re-readings of the transcripts were undertaken, and the relevant texts were selected and highlighted. The five coding

categories were then applied to the relevant texts to be categorized into meaningful segments. Finally, the verbatim quotes were selected as illustrations.

In order to enhance the trustworthiness of this study, two researchers coded each transcript independently. A coding was considered to be in agreement only if both coders assigned the code to the same text unit. All discrepancies were resolved through discussion. Intercoder reliability was calculated by dividing the number of coding agreements by the number of agreements and disagreements combined (Miles & Huberman, 1984, p. 63). The negotiated agreement approach helped to raise intercoder reliability from an initial 50% to 80%. Although there is no consensus on reliability standards for qualitative data, an agreement of 80% or greater is considered acceptable in most situations (Lombard, Snyder-Duch, & Bracken, 2002). Finally, all remaining disagreements were resolved through discussion.

3.5.3. Teachers' emotion expression and beliefs

In *Study II*, teachers' emotion expression was coded using deductive thematic analysis (Crabtree & Miller, 1999), in which an analytical scheme is developed *a priori* based on the theoretical constructs from a systematic literature review. The categories of teachers' emotion expression include natural expression, direct staging, suppression, and faking (Gong et al., 2013; Hagenauer & Volet, 2014; Hosotani & Imai-Matsumura, 2011; Jiang et al., 2016; Taxer & Frenzel, 2015). Teachers' beliefs were coded combining both deductive (Crabtree & Miller, 1999) and inductive thematic analysis (Le Compte & Preissle, 1993). This approach initiated theory-driven coding while allowing themes to emerge from the data during the analysis. Therefore, the coding scheme was developed both before and during the analytic process. Specifically, beliefs about teacher roles were summarized from previous literature (Davis, 2001; Kitching, 2009), so this theme was identified as *a priori*. The other three themes regarding teachers' beliefs emerged from the data during the analysis. Following data analysis, the researchers attempted to identify links between these data-driven themes and the existing literature that implicitly addressed the essence of these themes. For example, no previous literature talked directly about teachers' beliefs about their professional distance, but this theme can be connected with the term "professional distance," proposed by Hargreaves (2001).

It is important to note that teachers' beliefs were not directly addressed in the interviews but were inferred through the accounts of their emotional experiences during teaching. Teachers' experience while teaching was included in the core interview questions. The rationale for this design was based on the following propositions: First, in contrast with espoused or explicit beliefs, implicit beliefs are held unconsciously and can only be inferred indirectly (Basturkmen, 2012). Second, inferences from teachers' narratives about what they do or experience during teaching can help to uncover teachers' beliefs that are abstract and tacit representations (Kane, Sandetto, & Heath, 2002). Third, teachers' beliefs might be accessed by reporting on their emotions, because their emotions might reflect beliefs

about how a particular situation during teaching influences their emotional experiences (Robinson & Clore, 2002).

The coding process was developed in six phases. First, the audio-recorded interviews were transcribed verbatim, and two educational researchers read and reread the transcripts thoroughly. Second, the categories of emotion expression were identified based on the theoretical constructs extracted from the literature. Third, the researchers independently applied the categories of emotion expression to the text units. Fourth, the researchers independently summarized the meanings of the texts into themes of teachers' beliefs about a specific aspect of teaching. Fifth, the researchers engaged in discussion and compared their independent coding. Sixth, discrepancies between their independent coding were reconciled, and the final coding was agreed upon. The coding was considered to be in agreement only if both coders assigned the same code to the same text unit. In the end, a high level of agreement was reached between the two coders, and the intercoder reliability was 90%.

3.5.4. Teachers' autonomy-supportive and controlling behaviors

In *Study III*, the coding schemes of autonomy-supportive and controlling behaviors were developed based on a rigorous literature review. The coding categories of autonomy support included *providing explanatory rationales*, *acknowledging negative affect*, *using non-controlling language*, *offering choices*, *fostering interest in learning*, and *praise as informational feedback* (e.g., Assor et al., 2002; Jang et al., 2010; Reeve, 2009). The coding categories of controlling teaching included *relying on outer sources*, *using controlling language*, *rejecting negative affect*, *creating ego-involvement*, and *conditional regard* (e.g., Assor et al., 2004; De Meyer et al., 2016; Vansteenkiste et al., 2005).

Six phases were involved iteratively and cyclically before and during coding. In the first phase, the first and second coders collaboratively developed the coding schemes *a priori*, based on an extensive review of the literature concerning autonomy support and control. The coding categories were identified and modified as the literature review proceeded. In the second phase, the same two coders individually coded the videos based on the coding schemes, using the linguistic annotation software ELAN, version 5.0.0 (2017). The emerging issues were noted for discussion in the joint meetings. In the third phase, a series of intensive meetings were held by the two coders in which emerging issues were discussed, and perspectives were compared and integrated. In the fourth phase, the third coder, who did not take part in developing the coding schemes, coded the videos individually to contribute fresh perspectives and avoid bias. In the fifth phase, a series of intensive meetings were held by the first and third coders to compare what was produced by the first two coders and by the third coder. In the sixth phase, a final meeting was held by the first and second coders to discuss the discrepancy

between their coding and that of the third coder. Disagreement on coding was resolved, and the final agreement was reached after these meetings.

Finally, intercoder reliability was calculated using ELAN. Cohen's kappa was used to represent intercoder reliability, which refers to the ratio of annotation overlap and values (Cohen's κ in each video: minimum=0.87, maximum=0.93).

3.5.5. Roles of the author in the research and analysis process

Since the studies were conducted in the Finnish context and the author of this dissertation is not fluent in the Finnish language, it is important to clarify the data collection and analysis process. First, the interviews that took place in both the multicultural and local Finnish schools were conducted in English. The author conducted all the interviews with the teachers in English, and recorded them with a smart phone. Then the author transcribed the interviews verbatim and coded the transcripts in collaboration with other Finnish researchers. With regard to the video observation that took place in the Finnish local school, the author recorded the lessons with a digital camera from the back of the classroom. Since the lessons were given in Finnish, all verbal interactions shown in the videos were transcribed and subtitled in English by a Finnish researcher. Then the author coded the subtitled videos in collaboration with other Finnish researchers.

4. Overview of the empirical studies

This dissertation includes three studies that were all exploratory case studies. They aimed to investigate in depth the significance of and the associations between teachers' support for autonomy, competence and relatedness, and teachers' emotions and beliefs in the classroom.

Study I

Jiang, J., Vauras, M., Volet, S., & Wang, Y. (2016). Teachers' emotions and emotion regulation strategies: Self- and students' perceptions. *Teaching and Teacher Education, 54*, 22–31.

This study aimed to investigate teachers' emotion regulation strategies and relate them to students' perceptions of their teachers' emotions, using students' surveys and teachers' interviews. Specifically, this study aimed to explore how students perceive their teachers' emotions during teaching and what emotion regulation strategies teachers report employing during teaching, and how students' perceptions of teachers' emotions relate to their teachers' self-reports of emotion regulation strategies.

Four teachers and 53 students in Grades 7-9 from an international lower-secondary school in Finland participated in this study. All students completed the surveys of their teachers' perceived emotions during teaching. Students' perceptions of their teachers' emotions were assessed by the eight-item questionnaire that contained

eight emotion adjectives. The students rated the frequency of display of the teachers' emotions during teaching. After the students' surveys, each teacher participated in a semi-structured interview concerning their emotional experiences and emotion regulation strategies when teaching a particular class. The teachers were given a list of eight emotion adjectives that were the same as the eight items in the students' questionnaires. This emotion list aimed to prompt the teachers to reflect on the emotion regulation strategies they employ during teaching.

The frequency of display of the teachers' emotions during teaching, as perceived by their students, was calculated. Also, Principal Component Analysis was conducted to test construct validity. This analysis extracted two components and validated that the eight items did measure positive and negative emotions. All interviews were audio-recorded and transcribed, and the deductive template approach was employed based on Gross's process model of emotion regulation, which included situation selection, situation modification, attention deployment, cognitive change, and response modulation. In order to enhance the trustworthiness of analysis, two researchers coded each transcript of interviews independently. All discrepancies were resolved through discussion.

The results suggested that antecedent-focused emotion regulation might be more desirable than response-focused emotion regulation. In particular, reappraisal appeared more effective than suppression in increasing the expression of positive emotions and reducing the expression of negative emotions. Additionally, the findings suggested that suppression as a strategy should be discouraged, given that it may decrease positive-emotion expression and increase negative-emotion expression and may hinder the development of positive teacher-student relationships in a cyclic process. Finally, this study indicated that teachers' beliefs play an important role in teachers' interpretation of challenges and their employment of emotion regulation strategies.

To sum up, this study suggested that teachers should be encouraged to embrace empathy beliefs to interpret challenging situations, modulate emotional experiences, and foster close, supportive relationships with students. Also, they should be discouraged from using suppression as their emotion regulation strategy and encouraged to employ reappraisal to interpret challenges meaningfully during teaching. This study also validated collecting quantitative data from students to explore teachers' display of emotions and simultaneously examining teachers' emotion regulation strategies in light of students' perceptions.

Study II

Jiang, J., Vauras, M., Volet, S., & Salo, A. (2019). Teacher beliefs and emotion expression in light of support for student psychological needs: A qualitative study. *Education Sciences*, 9(2), 68.

This study aimed to explore teachers' beliefs and emotion expression and to discuss the findings in relation to SDT. Specifically, this study aimed to investigate teachers' beliefs and emotion expression via semi-structured interviews with teachers and to provide insights into teachers' beliefs and emotion expression in light of teachers' support for autonomy, competence, and relatedness.

The participants were six teachers in Grades 7 and 9 from a multicultural school in Finland. Each teacher participated in a semi-structured interview concerning their emotional experience and emotion expression when teaching a particular class. The teachers were first presented with a list of emotions, which have been frequently experienced by teachers or prominent in discerning teachers' emotions. The teachers were then asked to use the list to select the positive and negative emotions they experienced during teaching a particular class, and to reflect on their emotional experience and emotion expression while teaching that class.

Both deductive and inductive thematic analysis methods were used to code teachers' emotion expression and their beliefs during teaching. The categories of teachers' emotion expression were developed deductively based on theoretical constructs, including natural expression, direct staging, suppression, and faking. In contrast, teachers' beliefs were coded combining both deductive and inductive thematic analysis. This approach initiated theory-driven coding while allowing themes to emerge from the data during the analysis. Therefore, the coding scheme was developed both before and during the analytic process. Because teachers' beliefs exist in tacit forms (Basturkmen, 2012; Kane, Sandetto, & Heath, 2002), they were not directly addressed in the interviews but were inferred from teachers' accounts of what they experienced during teaching. All interviews were transcribed verbatim, and two researchers engaged in transcript coding through discussion to resolve discrepancies and agree on the final coding.

This study found that teachers' beliefs about their roles as educators, carers, and providers of reassurance reflected the constructs of autonomy, competence, and relatedness support: considering students' perspectives and feelings, expressing clear expectation, and caring for students. Teachers' beliefs about equality between teachers and students appeared connected with the constructs of autonomy support: trust in students and encouragement of their self-initiation. Teachers' beliefs about closeness to students reflected the construct of relatedness support: caring for students. Teachers' expression of negative emotions by discussing the problem with students conveyed the construct of autonomy support: explanatory rationales for expected student behaviors.

In sum, this study suggested that when teachers feel a need to express their negative emotions, losing one's temper or suppression should be discouraged, and discussing the problem with students should be preferred. Moreover, teachers' beliefs about their roles, teacher-student power relations, professional distance, and negative emotion expression can be discussed in light of the prominent constructs of

autonomy, competence, and relatedness support, as highlighted in the SDT literature. Hence, this study indicated that teachers' beliefs are valuable to the investigation of teachers' support for students' psychological needs and teachers' emotions.

Study III

Jiang, J., Vauras, M., Volet, S., Salo, A., & Kajamies, A. (in review). Autonomy-supportive and controlling teaching in the classroom: A video-based case study

This study aimed to explore teachers' autonomy-supportive and controlling behaviors through case studies using video analysis. Specifically, this study aimed to investigate how autonomy-supportive and controlling teaching develops during a lesson, what categories autonomy-supportive and controlling behaviors involve, and what teachers say and do to employ autonomy-supportive and controlling teaching.

The two participating teachers were from a secondary school in southwestern Finland. Four lessons by these two teachers were videotaped during their regular teaching. All verbal interactions in the videos were transcribed and subtitled in English for data analysis. The coding schemes were developed *a priori*, based on an extensive review of the literature concerning autonomy support and control. The coding categories of autonomy support included providing explanatory rationales, acknowledging negative affect, using non-controlling language, offering choices, fostering interest in learning, and praising as informational feedback. The coding categories of controlling teaching included relying on outer sources, using controlling language, rejecting negative affect, creating ego-involvement, and using conditional regard.

Three researchers coded teachers' utterances (verbal) and also interpreted teachers' tones and gestures (nonverbal) with the linguistic annotation software ELAN. The coding process involved interpretation of video episodes, individual coding, joint meetings, clarification of emerging issues, integration of different perspectives, and resolution of disagreements through discussion. Intercoder reliability was calculated using ELAN. Cohen's kappa was used to represent intercoder reliability, which refers to the ratio of annotation overlap and values.

The results showed that teachers employ both autonomy support and control to different extents, and the use of autonomy support and control may be contingent on different contexts. This study also found novel evidence of error tolerance as a category of teachers' autonomy-supportive teaching. This strategy has not been investigated from the perspective of autonomy support in previous research. Furthermore, the findings indicated that indirect control, including creating ego-involvement and conditional regard and its effects on students' learning and well-being in classroom contexts, should be explored further in future research. It was also found that teachers may focus on offering choices about the layout of classroom activities and the selection of learning materials but pay less attention to choices

about independent student opinions of the learning content. The results also indicated that controlling language may not have utility in motivating student classroom activities as expected by teachers. Finally, this study suggested that different teaching experiences, responsibility, and accountability may influence teachers' adoption of autonomy-supportive and controlling teaching strategies.

In conclusion, the complexity of the use of autonomy support and control found in this study indicated that teachers should be encouraged to self-reflect on the motivational strategies they employ and recognize their effects on students' learning and well-being. Furthermore, video analysis used in the study concerning autonomy support and control indicated the possibility of exploring more potential categories of autonomy-supportive and controlling teaching, such as error tolerance, found in the study.

5. Main findings and discussion

5.1. Main findings of the studies

The main aim of this dissertation was to investigate the significance of, and the associations between, teachers' emotions and beliefs in the classroom and teachers' support for autonomy, competence, and relatedness. The specific aims were to deepen the understanding of teachers' emotions, emotion regulation, emotion expression, teachers' beliefs, autonomy support, competence support, relatedness support, and controlling teaching theoretically and empirically; to develop valid methods to analyze these variables systematically; and to provide educational implications for fostering teachers' positive emotions and beliefs, and effective teaching to support students' psychological needs.

Study I found that antecedent-focused emotion regulation might be more desirable than response-focused emotion regulation. In particular, reappraisal appeared more effective than suppression in increasing the expression of positive emotions and reducing the expression of negative emotions. Additionally, the findings suggested that suppression as a strategy should be discouraged, given that it may decrease positive-emotion expression and increase negative-emotion expression, and may hinder the development of positive teacher-student relationships in a cyclic process. Finally, this study indicated that teachers' beliefs play an important role in teachers' interpretation of challenges and their employment of emotion regulation strategies. This study also deepened our understanding of teachers' emotions and provided a solid foundation for Study II.

Study II found that teachers' beliefs about their roles, teacher-student power relations, professional distance, and their negative emotion expression were connected with teachers' support for autonomy, competence, and relatedness. This study revealed that teachers' beliefs about teacher-student power relations might be valuable to discern teachers' appraisals of students' misbehaviors. The findings also suggest that discussing the problem with students rather than losing temper or

suppressing anger should be encouraged in the way of teachers' negative emotion expression. Furthermore, the issue of teachers faking a particular emotion, such as faking indifference as revealed in this study, should be investigated in future research. Finally, the detrimental effect of teachers' beliefs about the negative expression of anger as a safety belt (to secure teachers against the offensiveness of students' misbehaviors), could be explored in future studies.

Study III found that teachers employ both autonomy support and control to different extents, and the use of autonomy support and control may be contingent on different contexts. This study also found novel evidence of error tolerance as a category of teachers' autonomy-supportive teaching. This strategy has not been investigated from the perspective of autonomy support in previous research. Furthermore, the findings indicated that the effects of indirect control (ego-involvement and conditional regard) on students' learning and well-being in classroom contexts should be explored further in future research. It was also found that teachers may focus on offering choices about the layout of classroom activities and the selection of learning materials, but may pay less attention to choices about independent student opinions of the learning content. The results also indicated that controlling language may not have the utility in motivating student classroom activities as is expected by teachers. Finally, this study suggested that different teaching experience and responsibility and accountability may influence teachers' adoption of autonomy-supportive and controlling teaching strategies.

In sum, the three studies revealed that teachers' emotions and beliefs are intertwined with their support for students' autonomy, competence, and relatedness. The main findings were as follows: first, reappraisal appeared more effective than suppression in increasing the expression of positive emotions and reducing the expression of negative emotions; second, teachers' beliefs about their roles, teacher-student power relations, professional distance, and their negative emotion expression can be discussed in light of the prominent constructs of autonomy, competence, and relatedness support; third, the use of autonomy support and control appears to be complex and may be contingent on different contexts. This dissertation validated collecting quantitative data from students to explore teachers' display of emotions and simultaneously examining teachers' emotion regulation strategies in light of students' perceptions. This dissertation also validated the use of semi-structured interviews to explore teachers' beliefs and emotion expression and inferring teachers' beliefs from their accounts of their emotional and teaching experiences. Furthermore, the use of video analysis to explore autonomy support and control indicated the possibility of exploring more potential categories of autonomy-supportive and controlling teaching, such as error tolerance, as found in this study.

5.2. Conceptual and empirical contributions

This research made conceptual and empirical contributions to our understanding of teachers' emotional experience, emotion regulation, emotion expression, teachers' beliefs, and support for autonomy, competence, and relatedness. It also unveiled the relationship between teachers' emotions, beliefs, and need support. The empirical support for the context-based nature of autonomy support and control and the evidence of error tolerance as another category of autonomy support provide directions for future SDT grounded studies.

Study I found that reappraisal was more effective than suppression in increasing the positive-emotion expression and reducing the negative-emotion expression. Interestingly, Gross's (1998b) experiment regarding reappraisal and suppression showed different findings. In Gross's experiment, undergraduate participants were assigned to either a reappraisal or a suppression condition when watching a negative emotion-eliciting film. In this experiment, Gross found that both reappraisal and suppression reduced negative emotion-expressive behavior. In order to address the short-term consequences in a particular emotional context by using questionnaires, Gross and John (2003) related individual differences in the use of emotion regulation strategies to peer-reports of individuals' emotion expression in everyday life among a group of undergraduates. They found that reappraisal increased positive-emotion expression and reduced negative-emotion expression, whereas suppression reduced positive-emotion expression but had no relation to negative-emotion expression. Nevertheless, neither the film experiment nor the questionnaire study reported any indication that suppression increased negative-emotion expression. However, our study provided evidence that suppression not only reduced positive-emotion expression but also increased negative-emotion expression in the everyday school context.

Regarding expression of negative emotions, such as anger, Study II found that teachers used direct staging by losing their temper (e.g., dropping a book or pounding their fists on the table), by suppression, and by discussing the problem with students. In relation to previous research, McPherson et al. (2003) found that extreme and aggressive ways of expressing anger, such as yelling, were perceived as inappropriate by students while discussing anger with students was perceived to be appropriate because the former did not take into account student perspectives, but the latter did. Also, Study I found that suppression of anger should be discouraged, given that it may decrease positive-emotion expression and increase negative emotion expression, and may hinder the development of positive teacher-student relationships. In sum, it was found that losing one's temper or suppressing anger may not be a good solution, and discussion about a problem with students is recommended when teachers feel a need to direct-stage anger.

Regarding teachers' beliefs about their negative emotion expression, the teachers in Study II realized that, on the one hand, expression of negative emotions could be harmful to teaching, learning, teacher-student relationships, and classroom atmosphere. On the other hand, teachers' expression of negative emotions could be

beneficial for students' discipline and teachers' emotions. For example, Milla explained that her fake anger could help students calm down and maintain student discipline. Risto also believed that his negative expression of anger could be a safety belt to secure him against the offensiveness of student misbehavior, and could also reduce his anger. These findings are consistent with previous studies that have shown displays of negative emotions serve a purpose that is, performative display (Kitching, 2009; Zembylas, 2005b). This conceptualization may explain why teachers in Study II held contradictory beliefs about negative emotion displays. It is probable that teachers realize the detrimental effect of negative emotion displays, but at the same time they prefer to display negative emotions by direct staging (intentional expression) to achieve a goal. Therefore, Study II provided insight into why teachers direct-stage their negative emotions by discerning their beliefs.

The most important finding of Study II was that teachers' beliefs and emotion expression can be connected with the prominent constructs of autonomy, competence, and relatedness support, as highlighted in the SDT literature. In this study, teachers' accounts of their beliefs about their roles as educators, carers, and providers of reassurance reflected the constructs of autonomy support by taking into account students' perspectives and feelings; competence support by providing clear expectations; and relatedness support by caring for students (Bieg et al., 2013; Jang et al., 2010; Reeve, 2009). Teachers' beliefs about equality between teachers and students, rather than teacher authority, reflected the constructs of autonomy support (trust in students and encouragement of their self-initiation) (e.g., Assor et al., 2002). Teachers' beliefs about closeness to students rather than distance from students reflected the construct of relatedness support (showing caring for students) (e.g., Bieg et al., 2013). Teachers' expression of negative emotions by discussing the problem with students, rather than losing one's temper or suppression, reflected the construct of autonomy support (providing explanatory rationales for expected student behaviors) (Reeve, 2009; Reeve et al., 2014). Thus, Study II may facilitate SDT research to develop areas by intertwining need support with its concomitant constructs: teachers' beliefs and emotion expression.

Study III found that teachers employed both autonomy-supportive and controlling strategies during teaching, and even combined them in the same instructional sequence. This finding is consistent with the increasing recognition in SDT that teachers' autonomy support and control may not be two sides of the same coin, and its use may not be a simple all-or-none approach (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2009). More evidence from this study that supports the complexity of autonomy support and control, showed that the use of autonomy-supportive and controlling teaching was contingent on different contexts and had intra-individual differences. For example, Laura adopted controlling strategies more intensively in her own homeroom class, 8C, than in 7C. Compared to 7C, she had more responsibility and accountability for students' safety, well-being, behaviors, and contact with their parents in 8C. This responsibility and accountability in terms of

external forces (e.g., administrators and parents) may have affected her tendency to teach in a more controlling way in one class than in another (Reeve, 2009). This assumption could be linked to a previous experimental study that found teachers who were under pressure regarding their students' performance taught in a more controlling style than those who were not under such pressure (Flink, Boggiano, & Barrett, 1990). Although Reeve (2006) argued that what autonomy-supportive teachers say and do during instruction contrasts with controlling teachers, it still appears difficult to label teachers as autonomy-supportive or controlling teachers without considering the context. In light of the potential impact of teaching contexts on autonomy support and control, one should remain cautious about labeling teachers as autonomy-supportive or controlling.

The most important finding of Study III was evidence of error tolerance as a category of teachers' autonomy-supportive teaching strategies. Prior studies have emphasized that positive teacher attitudes toward student errors can foster a positive error climate, which involves treating errors as learning opportunities, encouraging students to discuss their misconceptions, and not ridiculing students when they make an error (e.g., Steuer, Rosentritt-Brunn, & Dresel, 2013). Moreover, students who believe that they will not be ridiculed when they make a mistake have been found more likely to communicate their misconceptions with teachers (Malmivuori, 2006). A previous study also found that students express more positive affective reactions (e.g., enjoyment) when teachers give them time to think about the correct answer by themselves than when correcting the mistake for them, redirecting it to another student, or asking the whole class to find the right solution (Tulis, 2013). However, no prior study has explored error tolerance from the perspective of autonomy support. In Study III, Anne's support for students to correct mistakes by themselves encouraged self-regulated learning (Malmivuori, 2006; Ryan & Deci, 2000). Also, her respect for their feelings in this process entailed integrating student perspectives into teaching (Reeve et al., 2014). Both are elements of autonomy-supportive teaching strategies.

5.3. Methodological considerations

Regarding the methodology of Study I, semi-structured interviews may not be a standard approach to assessing emotional expression and regulation, but were a deliberate choice for this exploratory study, among other methods. Due to the exploratory nature of this study and the small teacher sample, semi-structured interviews were considered more appropriate than questionnaires to investigate teachers' emotion regulation strategies. Moreover, the topic of this study involves teachers' complex feelings and emotional experiences. As Crouch and McKenzie (2006) proposed, in-depth inquiry could optimally encourage reflection on such experiences, rather than just reporting of them. For example, the math teacher revealed that he did not usually show his negative emotions. When he was asked to confirm whether not showing meant hiding, he replied definitely yes. He then continued to reflect on his reasons spontaneously. Therefore, interviews in this

instance far outweighed questionnaires to obtain more detailed and reflective information. It is also argued by Dreher (1994) that qualitative research with small samples, like the present study, facilitates researchers' closer association with respondents, which enhances reliability and validity.

Alternative approaches to assessing emotion regulation strategies include surveys, but survey instruments have their own limitations. For example, Ways of Coping Questionnaire (WCQ; Folkman & Lazarus, 1988) largely maps emotional regulation strategies, which includes 8 categories: confrontative coping, self-controlling, distancing, seeking social support, accepting responsibility, escape avoidance, planful problem solving, and positive reappraisal. However, this instrument is not extensive enough to encompass every single potential strategy. For instance, Austin, Shan, and Muncer (2005) used Stress Management Checklist (SMC; Stein & Cutler, 2002) to complement the WCQ in their research, because coping strategies such as exercise and relaxation are not included in the WCQ. In addition, alpha coefficients were not quite high in the original WCQ, just ranging from 0.61 to 0.79. Disappointingly, according to Peklaj and Puklek (2001), the reliabilities of some WCQ subscales were very low in their research into student teachers' coping in Slovenia, with self-control 0.38, confrontative coping 0.41, and accepting responsibility 0.51. It is also significant to note that Chan (1994) employed the WCQ to assess secondary school teachers' coping in Hong Kong, and four factors emerged rather than eight. Interestingly, the new four factors had higher internal consistency reliabilities (0.62-0.85) than those of the original eight subscales. The above-mentioned findings indicate that the WCQ might not be a best approach in some context or population in terms of its reliability and validity. Finally, Chan (2008) pointed out the limitation of his study using the WCQ to investigate coping among prospective and in-service teachers in Hong Kong. He admitted that interviews might address the limitation of quantitative self-report, because teachers' narratives could provide more insights into the topic. In sum, it was more sensible to use semi-structured interviews than survey instruments to investigate teachers' emotion regulation strategies in Study I.

Semi-structured interviews were also a deliberate choice among other methods for Study II. In the investigation of teachers' emotions, teachers' self-reports have been used almost exclusively, with quantitative questionnaires and qualitative interviews (for a review, see Keller, Frenzel, Goetz, Pekrun, & Hensley, 2014). However, questionnaires are only used to assess the frequency and intensity of teachers' emotions (e.g., Frenzel et al., 2016; Taxer & Frenzel, 2015). In contrast, interviews enable teachers to describe their emotional life at school, which facilitates the exploration of their professional self-understanding and identity (e.g., Cross & Hong, 2012; Darby, 2008). Regarding the investigation into teachers' beliefs, quantitative questionnaires or inventories (e.g., Isikoglu, Basturk, & Karaca, 2009) as well as qualitative interviews (e.g., O'Connor, 2008) have been used. However, questionnaires have been criticized as too restricted in scope and not validly

representing teachers' beliefs (Richardson, 1996). In addition, some questionnaires to assess teachers' beliefs may fall into a self-fulfilling prophecy, in which researchers' expectations are built into the instrument so that participants are likely to fulfill those expectations as they answer the survey (Kane, Sandetto, & Heath, 2002). In contrast, interviews enable participants to reflect on their teaching experiences and therefore offer opportunities to investigate their beliefs and values (e.g., O'Connor, 2008). Therefore, in light of the advantages of qualitative methods concerning teachers' emotions and their beliefs, Study II used semi-structured interviews and focused on the exploratory paradigm in order to provide in-depth and reflective insights into teachers' emotions and their self-understanding of the teaching process.

One may be concerned about the small sample size in relation to generalizability. Whether the sample size of the present research is adequate can be discussed from the perspective of information power, which suggests that the more information the sample provides, the lower number of participants is needed (Malterud, Siersma, & Guassora, 2015). In light of information power, the present research was grounded in established theories, recruited participating teachers with characteristics that were highly relevant for the aims of the studies, conducted strong and clear interviews based on core interview questions, employed rigorous interview and video coding schemes, and included in-depth analysis of teacher narratives and teacher-student interactions. Furthermore, the observational study concerning video analysis of two teachers' lessons provided a situative perspective that enabled micro-level interpretation of teacher and student interactions (Turner & Nolen, 2015), so that readers may determine whether findings from this case study can be extrapolated to similar cases. Most importantly, the transferability of findings in qualitative and exploratory research to other contexts is based on developing deep and contextualized understandings that can be applied by readers, rather than generalizing findings to a particular population (Levitt et al., 2018). In sum, the sample size of the present exploratory research was considered adequate for derived findings in relation to transferability, since the interviews and the video-taped lessons provided sufficient information power to offer new and substantial insights into teachers' emotions, beliefs and teaching strategies that could be applied by researchers or educators.

5.4. Methodological contributions

This research made an important methodological contribution by validating the use of students' perceptions to explore teachers' display of emotions. The research also validated the use of semi-structured interviews to explore teachers' beliefs and emotion expression and inferring teachers' beliefs from teachers' accounts of their emotional and teaching experiences. Further, it demonstrated the value of using video data analysis to investigate autonomy support and control.

Study I provided support for the value of collecting quantitative data from students to explore teachers' display of emotions while simultaneously examining teachers' emotion regulation strategies in light of students' perceptions. Earlier research involving students' perceptions of their teachers' emotions has often investigated how teachers' emotions influence them, mainly obtained from interview data. For example, Thomas and Montgomery's (1998) interviews of elementary school students revealed that teachers' yelling hurt their feelings; in the study by Perry, VandeKamp, Mercer, and Norby (2002), primary school students reported that they were aware of their teacher's unhappiness when they made mistakes; and in the study by Phelan, Davidson, and Cao (1992), high school students indicated that teachers perceived as caring would win their students' cooperation in studies, while those who were viewed as not caring would not motivate their low-achieving students to complete schoolwork so easily. However, Kunter et al. (2008) reported one of the scarce studies that used a quantitative method to assess teachers' emotion of enthusiasm from the perspectives of lower-secondary school students. Their questionnaire focused on only two factors: teachers' enthusiasm for mathematics and teachers' enthusiasm for teaching mathematics. Therefore, quantitative studies regarding students' perceptions of teachers' emotions are important but rare. Hence, Study I used eight-item questionnaires involving eight emotion adjectives to evaluate students' perceptions of teachers' display of emotions during teaching and connected them with the teachers' own accounts of emotion regulation strategies. This study validated the value of quantitative methods in this type of research.

Study II validated the use of semi-structured interviews to explore teachers' beliefs and emotion expression and inferring teachers' beliefs from teachers' accounts of their emotional and teaching experiences. These methodological strategies provide valuable implications for future studies concerning teachers' emotions and beliefs. First, by using semi-structured interviews, researchers in future studies can develop core interview questions based on established theories concerning teachers' beliefs and emotions and synthesize the emergent conception from teachers' self-reports to elucidate teachers' beliefs and emotions. Second, instead of just evaluating the frequency and intensity of teachers' emotions through questionnaires, teachers' narratives of their emotional experiences during teaching can facilitate in-depth insights into their emotional life in school as related to their professional self-understanding and identity. Third, teachers' beliefs can be inferred from their accounts of emotional and teaching experiences, rather than by directly asking what beliefs teachers hold or using restricted questionnaire items that may not validly represent teachers' beliefs.

Study III evidenced the value of using qualitative video-based observations to explore teachers' autonomy support and control. Previous empirical studies, such as student surveys, teacher reports, and classroom observations, were used to investigate autonomy-supportive and controlling teaching. Quantitative studies tend

to employ questionnaires to assess students' perceptions of teachers' autonomy-supportive or controlling behaviors (e.g., Assor et al., 2002; Furtak & Kunter, 2012; Reeve & Tseng, 2011), but cannot explore teachers' specific autonomy-supportive or controlling strategies in depth. Teacher self-reports (e.g., Reeve, Bolt, & Cai, 1999) describe specific autonomy-supportive behaviors but lack exploration of their controlling behaviors. In observational studies, autonomy support has been evaluated in terms of level by raters during their classroom visits (e.g., Jang, Reeve, & Deci, 2010), through raters' scoring of the frequency of autonomy-supportive behaviors in videotaped lessons (e.g., Haerens et al., 2013; Reeve et al., 1999; Van de Berghe et al., 2013), or reported by qualitative illustrations from excerpts of videotaped lessons (e.g., Andersen & Nielsen, 2013; Kupers, van Dijk, & van Geert, 2017). However, observational studies that provide qualitative illustrations of autonomy support, and direct and indirect controlling teaching, are rare. Study III filled this methodology gap, used qualitative video-based observations, and found error tolerance as another category of autonomy support. This finding indicated the possibility of exploring more potential categories of autonomy-supportive and controlling teaching, using qualitative video-based observations.

5.5. Educational implications

The findings of the empirical studies have implications for teachers' use of emotion regulation strategies and the importance of teachers' beliefs that facilitate effective emotion regulation and appropriate ways of expressing emotions in the classroom. Overall and most importantly, this research has implications for a better understanding of teachers' autonomy-supportive and controlling behaviors in the classroom.

Given that findings from Study I suggest that suppression can be ineffective in decreasing teachers' expression of negative emotions and is very likely to reduce their expression of positive emotions, teachers should be encouraged to refrain from employing suppression as their emotion regulation strategy. As Gross (1998b) suggested, one of the important functions of emotion is to convey individuals' wishes and needs to others, but suppression shuts down this function and may result in negative interactions with others. Therefore, suppression may hinder the development of positive teacher-student interactions. Furthermore, if teachers frequently experience negative emotions, such as anger, frustration, and anxiety, the employment of suppression will only lead to the accumulation of negative feelings in a vicious circle. In critical situations, teachers may suffer from severe physical issues and experience high levels of burnout (Carson & Templin, 2007), which could also trigger negative teacher-student relationships. The use of suppression as a strategy by the math teacher in Study I may have contributed to fewer positive relationships with students, which in return increased his experiences and expression of negative emotions in the classroom in a cyclical process. The evidence suggests that suppression as a strategy should be discouraged and those strategies found to be effective, such as reappraisal, should be developed.

Both Studies I and II found that teachers' beliefs play a crucial role in teachers' appraisals of situations, which may affect emotion regulation and expression. In regard to teachers' beliefs about teacher-student power relations, in Study II, Milla held a belief about students competing with her for power and deliberately making her lose control. This belief guided her to take student misbehaviors personally rather than attribute them to internal student-related factors (Bibou-nakou, Stogiannidou, & Kiosseoglou, 1999). Her belief about students competing with her for power was connected to the suppression of her anger. In relation to Study I, the English teacher had a strong belief about empathy toward challenging students and tried to understand them from his own experiences of school, which he reported as helping to regulate his negative emotions, whereas the math teacher believed in the importance of maintaining teacher authority, which he believed he could achieve by suppressing his negative emotions. It was suggested that teachers should develop effective emotion regulation strategies, such as reappraisal, and understand how to interpret challenges meaningfully and deal with them more adaptively. Also, promoting empathy beliefs in teacher education would be valuable, since embracing such beliefs appear to help in interpreting challenging situations and modulating emotional experiences as well as fostering close, supportive relationships with students.

Study III found that offering choices was the most frequently used autonomy-supportive teaching strategy. Apart from the frequency of offering choices, the types of choices are also important because organizational, procedural, and cognitive choices may produce different learning outcomes (Stefanou et al., 2004). Stefanou and colleagues found that organizational and procedural choices alone may not facilitate students' genuine adaptive motivation, whereas cognitive choices may foster more enduring and deep-level learning than organizational or procedural choices. In the present study, although offering choices was found on 17 occasions, only two involved cognitive choices when Anne in 8B encouraged students' self-evaluation of their writing. In contrast, Laura only provided students with options for the exercises they did during the lesson and asking students' preferences for activities in the coming lesson. However, she offered no cognitive opportunities for her students to express their independent opinions about the learning content. This finding suggests that teachers may focus on offering choices about the selection of learning materials (procedural) and the layout of classroom activities (organizational) but may pay less attention to choices regarding students' independent opinions of the learning content (cognitive). This finding also suggests that investigating the frequency of the teaching strategy alone does not necessarily inform the extent of autonomy support teachers provide, because the types of choices also matter. As concluded by Stefanou and colleagues, it is important that students have choices to formulate their independent opinions about the learning content, rather than just following teacher opinions.

Study III also found that using controlling language was the most frequently employed controlling teaching strategy. Laura used controlling language on nine occasions, much more than Anne, who used it on only two occasions. Anne used “have to” and “should” to request students to remember important learning content, and for all students to raise their hands. In contrast, Laura used not only “should” and “have to,” but also directives or commands to request students to concentrate on their tasks, use their time well, and even to remind one student to take off his hood. Importantly, she used commands in 8C intensively toward the end of the lesson to maintain student motivation. However, the high frequency of her commands did not appear effective in adjusting student passivity and low motivation. Eventually, her tone of statements sounded increasingly annoyed, but students did not show compliance with her commands. The use of controlling language by Laura may manifest a reaction to student passivity during learning activities with the expectation that this teaching strategy could directly and quickly produce the desired outcome (Reeve, 2009). However, previous research found that controlling language leads to student amotivation, intertwined with anger and anxiety (Assor et al., 2005). The present study showed that the more frequently Laura used controlling language, the more students displayed low motivation and the more Laura reacted to their passivity with controlling language. This cycle suggests that controlling language may not have the utility in motivating students that teachers may assume. Regarding reaction to student passivity, Anne’s strategies were different from Laura’s. In response to a student’s complaint about listing Finnish indefinite pronouns, Anne first acknowledged that this activity was difficult and then explained that its purpose was to help them identify and classify personal pronouns by heart. The findings of this study suggest that teachers need to acknowledge negative affect and provide explanatory rationales for expected student behaviors rather than using controlling language.

5.6. Future directions

Future research could further address up- and down-regulation of teachers’ emotions and the relationship between emotion regulation and teachers’ beliefs, and examine teachers’ faking indifference as emotion expression. Future research could also further explore the elements of autonomy support and control and how teaching contexts may affect their adoption.

An important research orientation for emotion regulation could be the focus on up-regulation. Study I contributed to more evidence that up-regulation needs attention among teachers and researchers. The teachers in this study talked about their experiences of negative emotions and the strategies of down-regulating negative emotions more than their experiences of positive emotions and the strategies of up-regulating positive emotions. Only two teachers mentioned up-regulating their positive emotions in the strategy of attention deployment. It is not surprising that Sutton et al. (2009) indicated that up-regulating positive emotions had received less attention in research.

Nevertheless, it appears difficult to identify the extent to which up-regulation ought to be conducted, because overly up-regulating a positive emotion (e.g., happiness) may be misunderstood as faking, which is defined as intentionally expressing an unfeared emotion (Pugmire, 1998). Similarly, overly down-regulating a negative emotion (e.g., anger) may be misunderstood as suppression, which is defined as the inhibition of emotion expression, such as hiding an experienced emotion or masking a negative emotion with a positive one (Gross, 1998b). Therefore, it is extremely important for future research to identify the boundary between up-regulation and faking, and down-regulation and suppression.

Important directions for future research could be addressed concerning the extent to which teachers' emotion regulation is associated with teachers' beliefs. It is important to note that the English teacher in Study I, who had a strong belief about empathy, regulated his emotions more effectively than the math teacher, who taught the same class of students and had a belief about teacher authority. This finding suggests that both teachers' emotions were intertwined with their cognitions (in terms of their understandings of teaching or teachers' beliefs), which is consistent with Hargreaves' (2001) conception of the integration of emotion and cognition. The above conclusion is also consistent with Cross and Hong's (2012) as well as Day and Qing's (2009) empirical research, which showed that teachers' empathy leads to resilience in the face of difficult situations and contributes to teachers' positive emotions. It has also been argued by McAllister and Irvine (2002) that teachers' empathy promotes a positive teacher-student relationship. It is therefore likely that the English teacher who had a belief about empathy developed positive relationships with his students, which increased his experiences and expression of positive emotions in the classroom in a positive cyclic process. This study suggests that exploring teachers' beliefs would be a valuable inclusion in future research on teachers' emotion regulation.

An important research direction for teachers' emotion expression could involve faking. Study II found that teachers faked their indifference to make students solve problems independently. For instance, Kirsi reported faking indifference by delaying her reaction to students' request for help so they could try to solve problems by themselves first. However, no previous research has reported teachers faking indifference, so its effect remains unknown. It is possible that teachers' faking indifference may harm students' egos (Deci et al., 1996) or create conditional regard (Assor et al., 2004) so that students are pressured to perform by internal feelings of shame or anxiety. As proposed by Taxer and Frenzel (2015), it is valuable for future research to investigate the discrete emotions teachers fake and the effect of faking a particular emotion, such as faking indifference as revealed in Study II.

Future research could further validate the coding schemes developed in this dissertation concerning autonomy support and control and explore more potential categories of autonomy-supportive and controlling teaching, such as error tolerance. It is also important that future research includes systematic observation studies of

the dynamics involving teachers' motivational strategies and students' motivation. In this case, researchers or educators could gain more insight into the development of autonomy support and control in the classroom as well as their effects. Further, combining video observation of teaching strategies with teacher and student reports in future research may enhance our understanding of teachers' autonomy support and control from multiple perspectives, including researchers, teachers, and students.

Future research could also examine the influence of teaching contexts on teachers' adoption of autonomy-supportive and controlling teaching strategies. In Study III, Anne was a subject teacher with thirty years of teaching experience, while Laura was both a subject and a homeroom teacher with only five years of teaching experience. That Laura appeared more controlling than Anne may be related to her responsibility and accountability for student behaviors as a homeroom teacher. Also, as a novice teacher, Laura might not have constructed systematic teaching strategies compared to Anne, who was a veteran teacher. Future research could explore the extent to which teaching experience and responsibility and accountability affect teachers' autonomy support and control.

Finally, more attention ought to be paid to indirect control in future research. Study III found that teachers employed indirect controlling teaching strategies, including creating ego-involvement and conditional regard. Similar to indirect control, prior studies in the parenting literature have investigated the concept of psychological control, which involves tactics such as guilt induction, shaming, love withdrawal, or contingent support to manipulate adolescents' thinking processes, emotions, and attachment to parents (Barber, 1996; Soenens, Vansteenkiste, Luyten, Duriez, & Goossens, 2005). In this sense, the indirect controlling strategies found in Study III could be linked to psychological control in parenting, because guilt induction, shaming, and contingent support were also used by the teachers in this study. For example, both teachers created internal compulsions of guilt or shame to motivate students to raise their hands, to make more effort in finishing homework, or to remove a hood. Laura also showed that her support for students (e.g., permission to go to the toilet) would depend on whether they emptied their pockets by taking out their cellphones. In light of evidence that parental psychological control is consistently predictive of depression in young people (Barber, 1996), Study III also found that the student who was publicly criticized by Anne for not completing his homework later turned around and looked anxiously at the camera. Indirect control and its effects on student learning and well-being in classroom contexts should be explored further in future research.

In conclusion, teachers' emotions, teachers' beliefs, and need support, along with the associations between these variables, have been theoretically, empirically, and methodologically explored in the present research. For future research directions, it is suggested that the elements worthy of further investigation revealed by this research be paid greater attention. It is expected that, based on the results of the present research, future studies would make more contributions to effective teaching

strategies that support students' psychological needs, the fostering of positive teachers' beliefs, and the promotion of teachers' well-being.

6. References

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