

JYU DISSERTATIONS 315

Sanni Pöysä

Students' Situational Engagement in Lower Secondary School

**Association with Overall Engagement
and Contextual Factors**



UNIVERSITY OF JYVÄSKYLÄ
FACULTY OF EDUCATION AND
PSYCHOLOGY

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ABSTRACT

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The present thesis was designed to contribute to the field of student engagement by examining the manifestations and correlates of students' situational engagement. The central focus in each of the three published sub-studies of this dissertation was on students' situational engagement and its variation. The data for the sub-studies were drawn from the First Steps follow-up study in Spring 2014 when the participating students were in Grade 7 (13–14 years of age). The subsamples used in the analyses of the present thesis were drawn from students (Study 1: $n = 57$; Study 2: $n = 709$; Study 3: $n = 301$), who were asked to assess their lesson-specific situational engagement using the InSituations (InSitu) Instrument at the end of their lessons. The data in Study 2 also consisted of 155 lessons that were observed using the Classroom Assessment Scoring System–Secondary (CLASS-S) observation tool (51 teachers). The data were analyzed using multilevel modeling with variable-oriented and person-oriented approaches. The results led to three main findings. First, the results provided evidence of the importance of examining student engagement at its situational level. Second, the findings enhanced the understanding of the student characteristics and contextual factors related to students' situational engagement and its variation. Particularly salient were the findings concerning the role that teacher–student interactions play in shaping students' situational engagement. Third, the results revealed associations between overall and situational engagement. Overall, the findings contributed to the research on student engagement by increasing the understanding of situational engagement, which is still a relatively understudied area within the research field. The findings of the thesis corroborate the literature on finding meaningful individual variation in student engagement, which needs to be acknowledged in both the research field and the school settings.

Keywords: student engagement, situational engagement, lower secondary school, teacher–student interaction, classroom observations

TIIVISTELMÄ (ABSTRACT IN FINNISH)

Pöysä, Sanni

Oppilaan tilannesidonnainen kiinnittyminen yläkoulussa: Yhteydet yleiseen kiinnittymiseen ja eri tilannetekijöihin

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Tässä väitöstutkimuksessa tarkasteltiin yläkouluikäisten oppilaiden koulun kiinnittymistä (engl. student engagement) sekä erityisesti siinä ilmenevää tilannesidonnaista vaihtelua. Väitöstutkimus sisältää kolme vertaisarvioitua ja julkaistua, Alkuportaati -seurantatutkimuksen aineistoon perustuvaa osatutkimusta. Osallistujina oli perusopetuksen 7. vuosiluokan oppilaita (13–14 vuotiaita; 1. osatutkimus: $n = 57$, 2. osatutkimus: $n = 709$ ja 3. osatutkimus: $n = 301$), joita oli osana seurantatutkimusta pyydetty arvioimaan oppituntikohtaista tilannesidonnaista kiinnittymistään InSituations (InSitu) Instrument mittaria hyödyntäen. Toisen osatutkimuksen aineisto sisälsi myös 155 videoitua oppituntia ($n = 51$ opettajaa), jotka arvioitiin käyttäen strukturoitua Classroom Assessment Scoring System–Secondary (CLASS–S) havainnointimenetelmää. Väitöstutkimuksessa käytetty aineisto analysoitiin monitasomallinnuksen keinoin hyödyntäen sekä muuttujakeskeistä että henkilökeskeistä lähestymistapaa. Väitöstutkimus tuotti kolme keskeistä päätulosta. Ensinnäkin havaittiin aiempaa kirjallisuutta vahvistaen, että oppilaiden kiinnittyminen vaihtelee oppitunnista toiseen, mikä puoltaa tarvetta tilannesidonnaisen kiinnittymisen tutkimukseen. Toiseksi tulokset osoittivat, että oppilaan tilannesidonnaisen kiinnittymisen kokemukset ovat yhteydessä tämän yksilöllisiin piirteisiin sekä eri tilannetekijöihin. Erityisen merkityksellisiä olivat toisen osatutkimuksen tulokset, jotka osoittivat opettajan ja oppilaan välisen opetusvuorovaikutuksen yhteydet oppilaan tilannesidonnaiseen kiinnittymiseen. Kolmanneksi tulokset kuvasivat sitä, kuinka oppilaan tilannesidonnainen ja yleinen kiinnittyminen ovat yhteydessä toisiinsa. Kaiken kaikkiaan väitöstutkimuksen tulokset lisäävät ymmärrystä oppilaiden tilannesidonnaisesta kiinnittymisestä ja osoittavat, että tilannesidonnaisen kiinnittymisen vaihtelu on tarpeen ottaa huomioon niin tutkimuksessa kuin koulun käytänteissäkin.

Avainsanat: kiinnittyminen, oppilaan kouluun kiinnittyminen, oppilaan tilannesidonnainen kiinnittyminen, yläkoulu, opettajan ja oppilaan välinen vuorovaikutus, luokkahuoneen havainnointi

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Jyväskylä, October 2020
Sanni Pöysä

LIST OF PUBLICATIONS

This doctoral thesis is based on the following publications, which are referred to as sub-studies or Study 1, Study 2, and Study 3 in the text. The articles are reprinted with permission of the publishers. Copies of the articles are appended to the thesis.

- Article 1** Pöysä, S., Vasalampi, K., Muotka, J., Lerkkanen, M.-K., Poikkeus, A.-M., & Nurmi, J.-E. (2018). Variation in situation-specific engagement among lower secondary school students. *Learning and Instruction*, 53, 64–73.
<https://doi.org/10.1016/j.learninstruc.2017.07.007>
- Article 2** Pöysä, S., Vasalampi, K., Muotka, J., Lerkkanen, M.-K., Poikkeus, A.-M., & Nurmi, J.-E. (2019). Teacher–student interaction and lower secondary school students’ situational engagement. *British Journal of Educational Psychology*, 89(2), 374–392.
<https://doi.org/10.1111/bjep.12244>
- Article 3** Pöysä, S., Poikkeus, A.-M., Muotka, J., Vasalampi, K., & Lerkkanen, M.-K. (2020). Adolescents’ engagement profiles and their association with academic performance and situational engagement. *Learning and Individual Differences*, 82, 101922.
<https://doi.org/10.1016/j.lindif.2020.101922>

The author of this thesis is the first author of all three research articles. She was responsible for the study design, searching and reviewing the literature, and writing the manuscripts. She carried out the statistical analyses in collaboration with a statistical expert who is also one of the co-authors. The author had also the main responsibility in organizing the collection of the situation-specific classroom data used in all three sub-studies and the classroom video recordings used in the second sub-study. The co-authors had advisory roles in the design of the study, data collection, and interpretation of the results, and they provided comments on all three manuscripts.

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1 INTRODUCTION

Research spanning more than three decades has designated student engagement as a key construct for understanding and improving students' learning. According to Fredricks et al. (2004), student engagement offers a rich and multifaceted characterization of students' learning-related behaviors, emotions, and cognitions (see also Wang et al., 2011). The existing literature depicts student engagement as a multidimensional construct, consisting of three distinct, yet interrelated, dimensions: behavioral engagement, emotional engagement, and cognitive engagement (e.g., Fredricks, Ye, et al., 2019; Li & Lerner, 2013; Skinner, 2016; Wang et al., 2019). Due to this multifaceted nature, student engagement can be used to capture the versatile ways in which students are involved with and committed to school and learning (e.g., Appleton et al., 2008; Fredricks et al., 2004; Skinner & Pitzer, 2012). Researchers' foci of interest in the field also include the antecedents and consequences of student engagement, and in recent years, the situation-specific and context-dependent fluctuations of engagement—the specific focus of this thesis.

A wide array of previous literature has demonstrated positive outcomes of student engagement, such as increased academic achievement and completion of school (e.g., Archambault et al., 2019; Fredricks et al., 2004). Previous studies have shown that engaged students achieve higher grades (e.g., Li & Lerner, 2011; Wang & Holcombe, 2010), score higher in achievement tests (e.g., Dotterer & Lowe, 2011), and make greater academic progress throughout their school careers (e.g., Ladd & Dinella, 2009). Complementing these findings, the literature also indicates that engagement predicts adolescents' aspirations and enrollment in post-secondary education (e.g., Gutman & Schoon, 2018; Hill & Wang, 2015). In addition, student engagement has been acknowledged as a strong protective factor against dropping out of school. Many studies have shown that students who exhibit lower engagement are at a greater risk of leaving school early (e.g., Wang & Fredricks, 2014), and that students who exhibit a rapid decline in their engagement or who show signs of withdrawal under multiple dimensions of engagement are at the highest risk (e.g., Archambault et al., 2009). As a protective

factor, student engagement has been shown to lead to a positive cycle where student participation is reciprocally associated with emotional connectedness and the two jointly enhance the subsequent engagement (see Finn & Zimmer, 2012).

Along with recognizing the positive outcomes of student engagement, the field has focused on identifying its antecedents and facilitators. Previous literature has suggested, for example, that during early-adolescent and adolescent years, students' engagement tends to decrease (e.g., Archambault et al., 2009; Eccles & Roeser, 2011; Roeser et al., 2000), and on average, girls are more engaged than boys (e.g., Lam, Jimerson, et al., 2012; Wang et al., 2011). In addition, the extent to which students are engaged has been linked with different contextual and internal factors, such as the fulfillment of psychological needs (Connell & Wellborn, 1991; Fredricks, Reschly, & Christenson, 2019) or experiences of received support from families, peers, and teachers (Wang et al., 2019).

Interestingly, there is also an increasing understanding in the field, that student's engagement should not be seen as a stable; instead, it should be considered malleable, and highly responsive to internal and external changes (e.g., Fredricks et al., 2004; Fredricks, Reschly, & Christenson, 2019; Lawson & Lawson, 2013; Skinner, Kindermann, & Furrer, 2009; Wang et al., 2019). However, while malleability of engagement has been suggested as one of the key candidates through which students' learning could be supported (e.g., Fredricks et al., 2004; Reschly & Christenson, 2012; Wang et al., 2019), studies examining the fluctuation of student engagement or capturing the ways in which the different internal and external changes contribute to variation in engagement are still scarce. This is regrettable because students' learning takes place in environments with frequent contextual variation, and as such, it is likely that students' engagement also fluctuates from one learning situation to another as well (see Eccles & Wang, 2012; Skinner, Kindermann, & Furrer, 2009).

To enhance the understanding of student engagement with respect to these fluctuations, the research on it has to be approached using repeated assessments of students' behaviors, emotions, and cognitions in authentic learning situations (Sinatra et al., 2015). Although the studies examining student engagement in this way, at the situational level, are still limited in number, some empirical evidence has demonstrated situational variation of engagement between lessons (e.g., Martin et al., 2015; Vasalampi et al., 2016). More research is needed to increase knowledge on factors that may promote or impede students' engagement *in situ*. However, it is not possible to capture the situational fluctuation of engagement nor provide detailed knowledge about factors that shape situational engagement, if student engagement is investigated at its overall or aggregated level (i.e., by focusing on students' typical engagement over time). Therefore, further studies concentrating namely on situational engagement and its variation are needed.

This dissertation was designed to contribute to the literature by investigating situational variation in student engagement. Based on previous literature that has suggested that adolescents face the risk of decreased engagement due to their age and developmental changes they are undergoing (Eccles & Roeser, 2009, 2011), this thesis focused its attention on young adolescents. To fill the research

gap in the field of student engagement, four general aims were set for the thesis to address the overarching theoretical, methodological, empirical, and practical interests, and three specific aims were specified in the three sub-studies. The general aims of this thesis centered on 1) gaining deeper knowledge and understanding of situational engagement (theoretical aim); 2) utilizing novel assessment tools and analytical methods to manage multi-level data (methodological aim); 3) identifying student characteristics and contextual factors associated with situational engagement (empirical aim), and 4) synthesizing results to suggest ways to foster students' situational engagement in the schools (practical aim). As for the specific aims of this study, the first was *to examine the situational variation in student engagement and the contextual factors and student characteristics contributing to this variation*. Toward this end, multilevel modeling techniques were used in the all three sub-studies to analyze the data obtained from the repeated in situ assessments of situational engagement in the classrooms. The second specific aim was to *investigate the associations between teacher-student interaction and student engagement*, and this was done by conducting classroom observations to understand the role of the teacher in student engagement. Finally, the third specific aim was to *identify the distinct student profiles based on overall engagement and examine whether those would differ based on students' situational engagement*.

2 THEORETICAL BACKGROUND

2.1 Conceptualization of student engagement

Student engagement is a multidimensional construct that has been broadly used to capture different aspects of students' involvement with and commitment to school and learning. More than three decades of increasing interest in this topic in the field has resulted in wide agreement that student engagement is an important predictor of academic performance. However, at the same time, the existing literature is riddled with diversity and inconclusiveness with respect to the definitions used for the construct. According to Fredricks, Ye, et al. (2019), the most prevalent conceptualization in the literature is that student engagement consists of three distinct, yet interrelated, dimensions: behavioral engagement, emotional engagement, and cognitive engagement. These three dimensions were taken as a base for conceptualizing the core of student engagement in the present study.

Behavioral engagement encompasses students' active involvement and efforts focused on learning and academic tasks as well as students' school-related conduct and participation in school-related activities (Fredricks et al., 2004; Wang et al., 2011). It is manifested, for example, by the intensity of students' contributions to their learning tasks, and through behaviors critical for learning, such as concentration, attention, effort, and persistence (Fredricks et al., 2004). It also encompasses positive conduct and compliance with school rules and norms, such as attending classes, completing assignments, and the absence of disruptive behavior (Fredricks et al., 2004; Wang et al., 2011).

Emotional engagement, which has also been referred to as affective engagement, comprises students' sentiments toward school and learning (Appleton et al. 2006; Fredricks et al., 2004; Skinner, Kindermann, & Furrer, 2009; Wang et al., 2011). It encompasses students' positive and negative reactions, such as feelings of happiness, interest, boredom, or anxiety with respect to school (Fredricks, Re-

schly, & Christenson, 2019; Skinner & Belmont, 1993). In addition, it captures students' sense of belonging and connectedness with other students, teachers, and school (Appleton et al., 2006; Finn, 1989; Voelkl, 1997).

Cognitive engagement reflects students' cognitive investment in learning and perceived relevance of schoolwork (Appleton et al., 2008; Archambault et al., 2009; Fredricks et al., 2004; Fredricks, Reschly & Christenson, 2019). It captures students' use of self-regulation strategies, such as their regulation of attention and effort to master knowledge or skills as well as the ways in which they integrate new information with existing knowledge (Fredricks et al., 2004). In addition, cognitive engagement is associated with valuing school and completing tasks because of their importance for personal future endeavors (Appleton et al., 2008).

Although behavioral engagement, emotional engagement, and cognitive engagement are commonly accepted as the key dimensions constituting the core of the construct of student engagement, the existing literature also offers alternative or complementary definitions for student engagement. These alternative definitions typically include a fourth dimension under this multidimensional construct. For example, these supplementary dimensions focus on *agentic engagement*, in reference to students' constructive contributions to the flow of the instruction (Reeve & Tseng, 2011), or *social engagement*, which is related to students' social interactions around the instructional content (Finn & Zimmer, 2012; Fredricks et al., 2016). While these additional dimensions can be seen to capture relevant aspects related to students' learning, researchers in the field have not widely accepted any of these dimensions into a standard core conceptualization of student engagement.

In addition to defining the core dimensions of student engagement and taking a stand on the presence of alternative or complementary definitions, conceptualizations of student engagement in the field have paid specific attention to students' disengagement as well. Due to the still evolving nature of the field, the existing literature provides two different approaches to understand disengagement. According to Wang et al. (2019), the first approach sees disengagement as the polar opposite or absence of engagement on a continuum, where disengagement is present whenever engagement is not. According to this view, disengagement can manifest itself, for example, as students' lack of concentration or incomplete assignments, a reduced sense of connectedness with other students, or minimal use of self-regulation strategies (see Skinner, Kindermann, & Furrer, 2009). The second and more recent approach defines disengagement as a conceptually and methodologically distinct construct from student engagement (Skinner, 2016; Wang et al., 2019). This view emphasizes that disengagement addresses also the presence of maladaptive behaviors and emotions, and therefore, disengagement cannot be seen merely as the opposite of engagement (Wang et al., 2019). This kind of conceptualization of disengagement allows for a more sophisticated depiction of the ways in which students' experiences of engagement can be understood. Within the present thesis, the second approach, which regards engagement and disengagement as partly separate constructs, was applied.

2.2 Theoretical perspectives on student engagement

The theoretical basis guiding the examination and understanding of student engagement draws from various theoretical perspectives, ranging from a focus on the dynamics of development of achievement motivation as well as the literature on school dropout and preventing early school leaving. Models with particularly wide reaching impacts in the field are, for example, the participation-identification model postulated by Finn (1989), the self-system process model posited by Connell and Wellborn (1991), and the stage-environment fit perspective introduced by Eccles and Midgley (1989). These perspectives have contributed significantly to the engagement literature by providing hypotheses and depicting how and why students become engaged with school and learning.

The *participation-identification model* by Finn (1989) seeks to clarify the developmental process leading to students' early school leaving or drop out. The model proposes that preventing dropping out requires a positive cycle in which affirmative experiences gained by students through successful participation in school activities lead to bonding and identification with school, which, in turn, lead to continued participation (Finn 1989; Finn & Zimmer, 2012). As the component of participation aligns with the content of behavioral engagement and identification with that of emotional engagement (Finn & Zimmer, 2012), the participation-identification model has been considered one of the earliest models for student engagement (e.g., Voelkl, 2012). The model, as well as the empirical evidence supporting this theoretical reasoning, proposes, first, that behavioral and emotional engagement are reciprocally connected, and, second, that engagement provides protection against alienation and withdrawal, which are linked to a high risk for dropping out (Finn & Zimmer, 2012).

The *self-system process model* (Connell & Wellborn, 1991) represents a motivational analysis, focusing on the relations between context, self, action, and outcomes. The self-system process model sets the social context as a base, whereby students have opportunities to experience structure, autonomy support, and involvement. Such experiences, in turn, either enhance or inhibit the fulfillment of fundamental psychological needs of competence, autonomy, and relatedness (Connell, 1990; see also the postulates of basic needs in self-determination theory, e.g., Deci & Ryan, 1985, 2000). The level at which these psychological needs are met is then manifested in students' engagement or disengagement which, in turn, relates to possible outcomes. Thus, in this model, engagement is seen as a mediator between the experiences of competence, autonomy, and relatedness, and different outcomes (see Appleton et al., 2008; Reschly & Christenson, 2012). Therefore, fulfilling these needs is seen to increase students' behavioral, emotional, and cognitive engagement (Fredricks, Reschly, & Christenson, 2019). Notably, the components forming the self-system process model have also been incorporated in more recent models of student engagement, such as the model of context, engagement, and student outcomes (Reschly et al., 2017), and the development-in-

sociocultural-context model for children's engagement in learning (Wang et al., 2019).

The *stage-environment fit perspective* provides an understanding of the development of adolescents' engagement in school (Eccles et al., 1993). Similar to the self-system process model, the stage-environment fit perspective sees experiences of competence, autonomy, and relatedness as crucial for students' learning and motivation (Eccles & Midgley, 1989). In the stage-environment fit perspective, it is further emphasized that because these psychological needs evolve as students grow up and mature, the school culture and practices do not necessarily provide optimal opportunities to fulfill those needs (Eccles et al., 1993). A mismatch between needs and opportunities may be particularly prevalent during adolescence and after the transition from elementary to lower secondary school (Eccles et al., 1993; Eccles & Roeser, 2009). Therefore, the stage-environment fit perspective provides a very plausible explanation for the significant decrease in engagement during adolescence and emphasizes the relevant optimal fit between the needs and opportunities afforded by the study context (Eccles et al., 1993; Eccles & Roeser, 2011; Mahatmya et al., 2012).

In addition to the participation-identification model, the self-system process model, and the stage-environment fit perspective, other theoretical perspectives have contributed to understanding of students' engagement and its development. Theoretical constructs and postulations from motivational models, such as self-determination theory (Deci & Ryan, 1985), expectancy-value theory (Eccles et al., 1983), flow theory (Csíkszentmihályi, 1990), and the ecological systems theory (Bronfenbrenner, 1992), in particular, can be seen to complement the engagement literature by providing insights on the underlying psychological processes related to students' behaviors, emotions, and/or cognitions. However, as engagement and motivational constructs partly share some of their theoretical basis, it needs to be acknowledged that there are some overlaps between the conceptualizations of engagement and motivation (see for a review, Skinner, Kindermann, Connell, & Wellborn, 2009).

Theoretical account of the relation between the constructs of engagement and motivation would be clearly needed. However, due to the wide range of different conceptualizations found in the fields of both motivation and engagement, a clear-cut distinction between the two cannot easily be reached. Attempts to draw distinctions can end up somewhat simplified or drawn on the basis of only some specific theoretical perspective. In the field of student engagement, some viewpoints set forth the interpretation that engagement and motivation are separate and independent constructs, but they are connected by one concept (i.e., motivation) functioning as the underlying cause and the other (i.e., engagement) as the effect. For example, Reeve (2012) frames motivation as a private and subjectively experienced process that causes engagement, and Skinner, Kindermann, Connell, and Wellborn (2009), in turn, characterize engagement as an "outward manifestation of motivation" (p. 224; see also Fredricks, Reschly, & Christenson, 2019). Connections between engagement and motivation are also alluded to within the definitions and descriptions of certain specific motivational concepts.

For example, the well established motivational construct of *interest* has been described as a factor that may contribute to and sustain engagement (Ainley, 2012; see also, Fredricks et al., 2004; Hidi & Renninger, 2006; Schiefele, 2009). Hidi and Renninger (2006), for instance, describe that “People may make a decision to become interested in particular content, but more typically interest mediates the way in which they engage content and impacts whether and how they choose to reengage that content over time” (p. 120; see also Ainley et al., 2002). The distinction designating motivation as a preceding condition or as one of the prerequisites for engagement is embedded perhaps most explicitly in the self-system process model (Connell & Wellborn, 1991). This kind of theorizing and positioning is particularly relevant for the examination of the relation between the context (e.g., situational factors) and indices of engagement (e.g., enacted behavioral action, emotional sentiments, goal orientation), as was done in this present thesis.

2.3 Overall and situational engagement

Prior literature has described students’ engagement as malleable (e.g., Fredricks et al., 2004) and highly responsive to contextual changes (e.g., Skinner & Pitzer, 2012; Wang et al., 2019). In lower and upper secondary education, school contexts are characterized by frequent contextual lesson-to-lesson variations, as, for example, group compositions and teachers changes during the school day. Therefore, due to students’ responsiveness to contextual changes, it is likely that their engagement fluctuates from one learning situation to another (see Skinner, Kindermann, & Furrer, 2009). Research aiming to capture the variation from lesson to lesson, is, however, scant, and only a limited number of studies have focused on situational fluctuation of student engagement. This gap was an important motivating factor for the present thesis.

To gain knowledge on situational variation of student engagement, methodological approaches are required that are able to capture students’ behaviors, emotions, and cognitions in situ (e.g., Sinatra et al., 2015). Such approaches provide detailed information on student engagement within specific learning-related situations, and, therefore, advance understanding on students’ *situational engagement* (also called momentary engagement). Thus far, the vast majority of prior research has utilized methodological approaches that assess students’ engagement on a more general level, focusing on students’ *overall engagement*. Overall engagement is typically assessed with rating scales that are conducted at single time points, and by aggregating information over different learning situations and time points, or by seeking to understand students’ average engagement (Eccles & Wang, 2012).

Although overall and situational engagement target the same construct (i.e., student engagement), as presented in Figure 1, due to different methodological approaches and time scales, a clear distinction between the two levels is needed. Studies on overall engagement provide valuable insights on student engagement

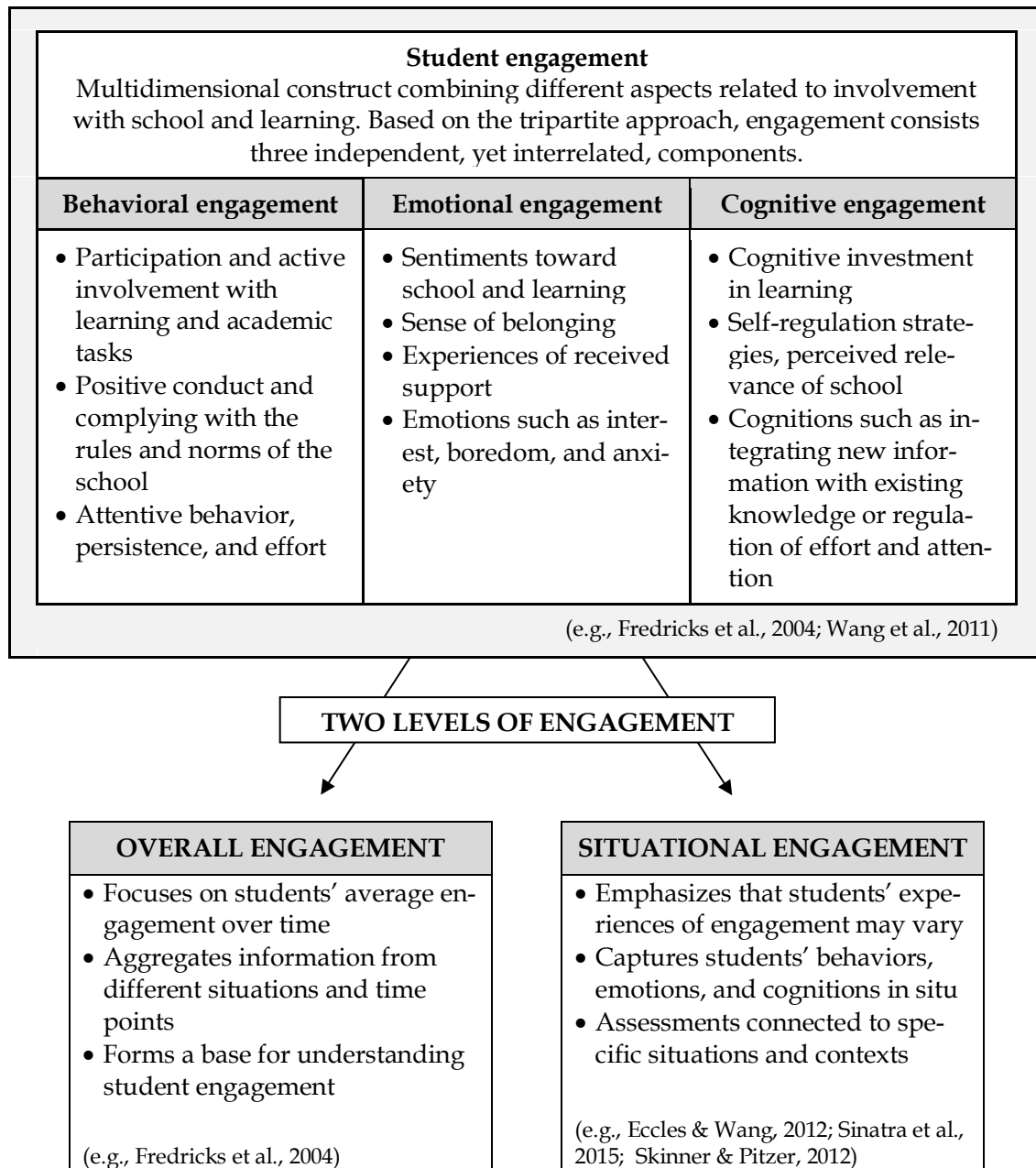


FIGURE 1 Two levels of student engagement

as they, for example, can inform about developmental trajectories, such as how students' engagement changes across the school years (Archambault et al., 2009; Eccles & Roeser, 2011), or can explain associations between engagement and different individual characteristics (e.g., Wang et al., 2011). However, measures of overall engagement do not take into consideration that students' engagement may be affected by external factors during the time of the assessments or that obtaining accurate evaluations of students' average engagement over time (i.e., reflecting their typical engagement) is a difficult task for both students and teachers (see Eccles & Wang, 2012; Hofkens & Ruzek, 2019).

Research designs seeking to capture situational engagement acknowledge that students' experiences of engagement may vary, and assessments are tied to situations and contextual factors. At this point, studies focusing on students' situational engagement have provided some empirical evidence showing intra-individual variation in students' situational engagement (e.g., Martin et al., 2015; Vasalampi et al., 2016), and they have begun to reveal possible factors that lead to fluctuations in situational engagement (e.g., Inkinen et al., 2019; Patall et al., 2018). However, the number of studies has been increasing quite slowly, because analysis capturing intra-individual variation in situational engagement requires time-consuming procedures and intensive datasets where assessments are tied to specific situations (see Fredricks & McColskey, 2012; Malmberg, 2020). Prior literature in the fields of student engagement and motivation indicate that this kind of data concerning students' lesson-specific classroom experiences during and after the lessons can be reliably studied using mobile technology (Malmberg et al., 2015; Martin et al., 2015; Tsai et al., 2008). As measures using such technology have been reported as used-friendly, and they can be used to collect rich data (see Malmberg et al., 2019; Wilhelm et al., 2012), it is a noteworthy solution when aiming to capture student engagement at the situational level.

The present thesis aims to gain a novel understanding of students' situational engagement by capturing student characteristics and contextual factors associated with intra-individual variation at the situational level. In addition, due to previous theoretical suggestions that students' situational engagement is formed partly on the basis of their overall engagement (Lawson & Lawson, 2013), the present thesis aims to advance the field forward by exploring whether students' overall engagement would be associated with their situational engagement.

2.4 Factors influencing student engagement

2.4.1 Engagement in relation to students' characteristics

According to the previous literature, gender, age, and family's socioeconomic status are among the main student characteristics that may play a part in shaping students' engagement. Numerous studies have indicated gender differences in student engagement, and on average, girls' engagement seems to be higher than that of boys (e.g., Lam, Jimerson, et al., 2012; Wang et al., 2011). Based on suggestions in the literature, compared to boys, girls' higher engagement could be explained, for example, by their higher sense of relatedness (Furrer & Skinner, 2003) or their higher skills in planning and managing studies as well as regulating their cognitions (Kenney-Benson et al., 2006; Martin, 2004). The existing literature has also suggested that engagement tends to decrease during early-adolescent and adolescent years (e.g., Archambault et al., 2009; Eccles & Roeser, 2011; Roeser et

al., 2000), but similar gender differences in student engagement have been documented across different age groups (Archambault & Dupéré, 2017; Li & Lerner, 2011).

Prior studies have suggested that a low socioeconomic status is a risk for lower engagement (e.g., Li & Lerner, 2011). This is in line with the literature documenting that socioeconomic status, reflecting parental education and occupational status as well as family income, is associated with a wide array of children's cognitive, interactional, and developmental outcomes (see Blair & Raver, 2012; Bradley & Corwyn, 2002). However, the empirical evidence about the relation between socioeconomic status and the level of student engagement is somewhat inconsistent. For example, in the Finnish context, Linnakylä and Malin (2008) demonstrated a relation between a lower socioeconomic status and students' lower engagement, whereas Virtanen et al. (2018) showed that socioeconomic status was not related to students' engagement in lower secondary school.

In sum, the existing literature suggests that student characteristics contribute to student engagement. As gender, age, and family's socioeconomic status represent relatively stable student characteristics that cannot be altered, they should be acknowledged and controlled for in the analyses and taken into account in school practices.

2.4.2 Engagement in relation to contextual factors

Several theoretical approaches guiding the examination and understanding of student engagement have highlighted that students' engagement is formed in transaction between the individual and the context in which learning is situated. For example, the self-system process model and the stage-environment fit perspective attribute levels of student engagement to students' levels of satisfaction with their experiences of their need for competence, autonomy, and relatedness in the educational context (see Connell & Wellborn, 1991; Eccles et al., 1993). The critical role of context is also delineated, for example, in the bioecological model of human development (Bronfenbrenner & Morris, 2006), which emphasizes that development is influenced by evolving proximal processes, time, personal characteristics, and different types of contexts. The noteworthy contextual factors related to student engagement and its situational fluctuation at school include structural factors, such as school subjects and instructional methods, but also different types of myriad social interactions with families, peers, and teachers that affect students' learning-related experiences (see Reschly & Christenson, 2012, 2019; Skinner & Pitzer, 2012).

With respect to structural factors of the school context, the existing literature has shown that students report some differences in engagement with respect to specific subjects. For example, Shernoff et al. (2003) found that students reported higher engagement (more specifically, higher experiences of concentration, interest, and enjoyment) in non-academic subjects (e.g., computer science and arts), compared to lessons in academic subjects (e.g., mathematics and history). As previous studies have suggested that students' engagement can be associated with different instructional practices (e.g., Lam et al., 2016; Vauras et al.,

2019; Volet et al., 2017), differences between subjects could be related to instructional practices typical of the specific subject and to opportunities that the subjects provide for individuals to experience competence, autonomy, and relatedness.

Along with different structural factors, relationships with family, peers and teachers have been associated with variation in student engagement (see for a review, e.g., Wang et al., 2019). The family is a critical developmental context, as it provides a base for academic and motivational support as well as parental supervision, which helps students reach their goals and expectations (e.g., Appleton et al., 2006; Reschly & Christenson, 2012, 2019). In addition, parents may foster engagement through interactions and joint activities that offer opportunities to feel competent, act in autonomous ways, and develop a sense of relatedness. For example, Furrer and Skinner (2003) showed that students' experiences of relatedness with their parents predicted behavioral engagement at school. Thus, a supportive family context is likely to enhance student engagement and may operate as a protective factor against disengagement.

Relationships with peers and interactions with the classroom social group also constitute relevant contextual factors that contribute to student engagement. During adolescence, peers become increasingly important, and they influence on each other's engagement through the values, expectations, and aspirations they attach to school as well as through their development of meaningful relationships (Reschly & Christenson, 2012; Ryan et al., 2019). Prior literature has shown that students tend to make friends with those with whom they share somewhat similar patterns of motivation, engagement, and achievement (selection effect), and over time, they become even more alike with respect to some of these features (influence effect; see Shin & Ryan, 2014a, 2014b; Wang et al., 2018; Wang et al., 2019). Therefore, in optimal cases, peers can set the stage for increased overall and situational engagement through both influence and selection effects; however, associating with peers with negative attitudes toward school and who are prone to truancy or risk behaviors can pose a high risk for decreased school engagement (see Ryan et al., 2019; Wang et al., 2018).

The role that teachers may play in shaping student engagement is particularly pronounced, as teachers are in a key position to provide students with focused support. Teachers are likely to influence students' engagement, for example, through clear and appropriate expectations as well as via caring teacher-student relationships (e.g., Appleton et al., 2006; Roorda et al., 2011; Wang et al., 2019). Furthermore, students' opportunities to experience a good fit for their needs of competence, autonomy, and relatedness also rests to a large extent on the actions of their teachers (see Eccles et al., 1993; Eccles & Roeser, 2009). These actions can include, for example, instructional methods that consider the students' perspectives or participatory opportunities but, perhaps, especially those important interactions that foster the teacher-student relationship and a positive emotional climate in the classroom (see Bronfenbrenner & Morris, 2006; Eccles & Roeser, 2009; Skinner & Pitzer, 2012). To gain a deeper understanding of the role

teacher–student interactions play in shaping student engagement at the situational level in classroom lessons, the present thesis utilizes the Teaching Through Interaction framework to conceptualize the quality of teacher–student interactions (see e.g., Hafen et al., 2015; Hamre et al., 2013).

2.4.3 Teaching Through Interaction framework and student engagement

Teaching Through Interaction (TTI) framework (Hafen et al., 2015; Hamre et al., 2013) represents one of the most well-known, comprehensive depiction and assessment systems that has successfully increased understanding of the key components and dynamics of teacher–student interactions. It has been derived from a strong theoretical background and empirical evidence related to students' learning, motivation, and academic achievement (see for a review, e.g., Allen et al., 2013; Hamre et al., 2013; Pianta, Hamre, & Allen, 2012). As the components constituting high quality and efficient classroom interaction overlap with features in schools and classrooms that contribute to high student engagement, the TTI framework can inform about the distinct mechanisms through which the quality of teacher–student interactions may influence students' emotional, behavioral, and cognitive engagement.

The TTI framework appraises teacher–student interactions by dividing them into three board domains: emotional support, classroom organization, and instructional support (Hamre et al., 2013). *Emotional support* focuses on the qualities of interactions that promote students' social and emotional functions in the classroom. Its theoretical foundation is based on attachment theory and self-determination theory (Hamre et al., 2013). Deriving from attachment theory (Bowlby, 1969), the domain of emotional support emphasizes that students need safe, predictable, and consistent learning environments. Such environments are seen to support students' self-reliance and ability to take risks (Pianta, Hamre, & Allen, 2012). From the perspective of self-determination theory (Deci & Ryan, 1985), the domain of emotional support highlights that students are driven by an innate psychological need to experience competence, autonomy, and relatedness. Fulfillment of these needs is seen to pave the way for students' motivated and engaged learning (Hamre et al., 2013; Pianta, Hamre, & Allen, 2012; see also Roorda et al., 2011).

The TTI framework depicts that emotionally supportive teacher–student interactions comprise positive climate with warm and respectful relationships, teacher sensitivity through awareness of and responsiveness to students' needs, and regard for adolescent perspectives to enhance their developmental needs (Pianta, Hamre, & Allen, 2012). The content of emotional support, as described in the TTI, aligns to a very high degree with the basis that the self-system process model and the stage-environment fit perspective set for student engagement, and it is in accordance with aspects used to define emotional engagement (see Connell & Wellborn, 1991; Eccles et al., 1993; Fredricks et al., 2004). A positive relation between emotionally supportive teacher–student interaction and the premises of emotional engagement has been documented in studies conducted by utilizing measures operationalized in line with constructs from the TTI framework

(Rimm-Kaufman et al., 2015). However, it has also been documented in studies that approached emotional support from different perspectives (e.g., Lam, Jimerson, et al., 2012; Roorda et al., 2017; Skinner & Pitzer, 2012). For the most part, the positive relations have been identified at the level of overall engagement (Reyes et al., 2012), but some evidence can also be found for situational engagement with respect to observed behavioral engagement (Malmberg et al., 2010).

Classroom organization focuses on interactions that increase students' positive behaviors and captures aspects that enhance the management of classroom situations (Hafen et al., 2015). The theoretical foundation of classroom organization is based on theoretical and empirical understandings of the development of self-regulatory skills (Hamre et al., 2013). The conceptualization in this TTI domain emphasizes that students' engaged learning can be fostered through consistent behavioral expectations and well-regulated efficient classroom environments (Emmer & Stough, 2001; Pianta, Hamre, & Allen, 2012). According to the TTI framework, teacher-student interactions that result in effective classroom organization include behavior management that encourages desirable behavior and productivity that maximizes the time used in learning. Furthermore, they are marked by the absence of negativity, such as punitive control or disrespectful communication (Pianta, Hamre, & Mintz, 2012).

While studies combining the TTI framework and student engagement are still admittedly limited in number, prior literature has provided some evidence of a positive association between the quality of classroom organization and higher behavioral engagement at the overall level (e.g., Virtanen et al., 2013) and also at the situational level (Malmberg et al., 2010). Theoretically, the domain of classroom organization is in agreement with student engagement constructs, for example, through the self-system process model that sees well-structured and effectively orchestrated classrooms as facilitators of experiences of competence as well as engagement (see Wellborn & Connell, 1991). In addition, this TTI domain emphasizes the self-regulation skills that are seen as a requirement for students' cognitive engagement (see Fredricks et al., 2004).

Instructional support focuses on teacher-student interactions that foster students' comprehension and learning through versatile strategies and well-targeted feedback (Hafen et al., 2015). High-quality interactions in this domain involve, for example, teacher's instructional practices that support students' learning by scaffolding them to comprehend the contents deeply and to interconnect new constructs with their previous knowledge (see Mayer, 2002; Vygotsky, 1991; Wood et al., 1976). Within the domain of instructional support, student engagement can be seen as resulting from strategies that are well suited for fostering student comprehension and mastery, and as the outcome of effective and focused feedback that helps students carry on with their learning (Pianta, Hamre, & Mintz, 2012).

Studies that documented positive associations between classroom organization and students' behavioral engagement also found associations between instructional support and student engagement (Malmberg et al., 2010; Virtanen et

al., 2013). This kind of connection is logical and has some face value, as the constructs in the domain of instructional support seek to capture the interactions that foster students' cognitive development (see Fredricks et al., 2004). The TTI framework emphasizes that effective learning requires tailored strategies and well-targeted support, and it can be assumed that interactions that enhance instructional support also provide opportunities to strengthen student engagement by affording students experiences of competence and autonomy (see Connell & Wellborn, 1991; Eccles et al., 1993; Fredricks et al., 2004).

The TTI framework depicts the dynamics of productive teacher–student interactions under three key domains, and these perspectives also provide insights into the role that teachers play in shaping student engagement. Based on the existing literature, emotional support, classroom organization, and instructional support, manifested in teacher–student interactions, can be seen as facilitators of student engagement. Particularly interesting is the potential connection between the inherently fluctuating nature of teacher–student interactions and students' situational engagement. Empirical evidence examining the quality of teacher–student interactions as facilitators of engagement at the situational level is still very scant, and the present thesis aims to address this gap.

2.5 Measuring indicators and facilitators of student engagement

To reach an understanding of student engagement and its fluctuations, it is necessary to capture multifaceted and detailed information about students' experiences (see Sinatra et al., 2015). In the field of student engagement, it has been suggested that knowledge on indicators and facilitators of engagement is needed to gain a full understanding about the dynamics of engagement (e.g., Reschly & Christenson, 2012; Skinner, 2016). Indicators of engagement are used to describe the characteristics and manifestations of a student's behavioral, emotional, and cognitive engagement, such as engaging in expected behavior, being attentive, finding learning tasks interesting, or investing effort (e.g., Skinner et al., 2008). Facilitators of engagement, in turn, can be conceptualized as explanatory factors that contribute to students' engagement (e.g., Skinner & Pitzer, 2012). For instance, a student's experiences of received emotional support in the teacher–student relationship or appreciation and encouragement from the family may be critical for building of a positive cycle where students adopt positive sentiments and values toward school and the adults there, which, in turn, leads to engagement through feelings of belonging.

Although a distinction between indicators and facilitators has been suggested in the field, an agreement on how they should be handled when measuring engagement, has not yet been reached (e.g., Fredricks, Reschly, & Christenson, 2019; Reschly & Christenson, 2012). Some scholars argue that facilitators of engagement should not be contained in conceptualizations or measurements of student engagement (e.g., Lam, Wong, et al., 2012), whereas others highlight the role

of contextual factors in shaping student engagement and, thus, include facilitating factors in the measurement of engagement along with the core indicators (e.g., Appleton et al., 2008). This thesis follows more closely the latter view, as situational fluctuations of engagement emphasizes that students' engagement is formed in transaction with contextual and facilitating factors. Therefore, the measures selected to assess overall and situational engagement in the present thesis, capture indicators as well as facilitators of student engagement, but indicators and facilitators were assessed with separate subscales.

In the existing literature, several different methods for measuring student engagement have been introduced (see Fredricks et al., 2011). The most common are students' self-reporting methods (Hofkenz & Ruzek, 2019), which can be utilized when seeking to capture student engagement at the overall level as well as when examining its fluctuations at the situational level (Fredricks & McColskey, 2012), or whether the aim is to capture either indicators or facilitators of engagement (Reschly & Christenson, 2012). Self-reporting methods are particularly well suited for assessing student engagement, because engagement is seen to involve certain aspects, such as inner experiences of interest or cognitive processes that are not easily observable by teachers or other external evaluators (e.g., Appleton et al., 2008). It should be noted that measurements can capture actual experiences of students only if they are invited as key informants (Reschly & Christenson, 2012). Nevertheless, along with these notable advantages, self-reporting methods also rely on the assumption that students are able to express their experiences through a series of specific questions, and that students will answer honestly, as opposed to choosing answers that they believe are preferred (Fredricks & McColskey, 2012; Hofkens & Ruzek, 2019). Therefore, while self-ratings provide irreplaceable and unique understandings about student engagement, the potential disadvantages must be acknowledged as well when striving to reach multifaceted knowledge on engagement from self-reports, as was done in the present thesis.

2.6 Person-oriented approach to examining student engagement

Most of the previous studies on student engagement have deployed a traditional variable-oriented approach (Fredricks, Ye, et al., 2019), focusing on the universal and linear statistical associations between measured variables (Bergman & Anderson, 2010; Bergman & Trost, 2006). While research conducted utilizing a variable-oriented approach indisputably provides valuable knowledge on how predictive variables explain variances in outcome variables (Laursen & Hoff, 2006), such approach has been criticized for its reliance on the assumption that populations are homogeneous with respect to the ways in which the predictive and outcome variables are associated (Laursen & Hoff, 2006; von Eye et al., 2006). It has been suggested that understanding gained through a variable-oriented approach could be complemented by analyzing differences among clusters of individuals

using an alternative analytical approach, that is, a person-oriented approach (Bergman & Trost, 2006; Laursen & Hoff, 2006; Lawson & Lawson, 2013).

A person-oriented approach assumes, first, that populations are heterogeneous with respect to the ways in which the measured variables are related to possible outcomes (Bergman & Trost, 2006; Laursen & Hoff, 2006). This leads to a second assumption, which is that populations can be divided into subgroups of individuals who share patterns of similarities and differences with respect to the measured variables (Bergman & Trost, 2006; Laursen & Hoff, 2006). Hence, in the field of student engagement, a person-oriented approach may reveal subgroups of students who are engaged in different ways (Eccles, 2016), thereby adding to the field by describing the associations between variables in a more nuanced manner (Lawson & Lawson, 2013).

Previous studies conducted using a person-oriented approach have demonstrated that subgroups of students with different types of engagement profiles can be recognized, and that these subgroups differ in the ways in which the predictive and outcome variables are associated (e.g., Fredricks, Ye, et al., 2019; Li & Lerner, 2011; Wang & Peck, 2013). For example, Lawson and Masyn (2015) utilized a person-oriented approach to characterize different kinds of dispositions on cognitive and affective engagement in school. From the students' self-reported items describing student initiative, student investment, student ambivalence, and disidentification, they found six subpopulations of engagement dispositions. These were examined further to identify different educational attainment outcomes between the groups, and with this kind of analytical process, Lawson and Masyn (2015) were able to nominate targeted suggestions on the ways in which students in the different subgroups could be supported. In general, a person-oriented approach provides the possibility to move beyond singular suggestions for fostering students' engagement into more focused recommendations (see Lawson, 2017).

While the majority of research on student engagement still utilizes a variable-oriented approach, the number of studies utilizing a person-oriented approach has grown steadily over the last few decades. However, according to Fredricks, Ye, et al. (2019), only a few examples of studies utilizing a person-oriented approach that have simultaneously included all three dimensions of engagement (i.e., behavioral, emotional, and cognitive) can be found. In most cases, analyses are drawn by focusing on some specific dimensions (see e.g., Lawson & Masyn, 2015; Li & Lerner, 2011). Even rarer are studies that have utilized a person-oriented approach to enhance understanding of situational fluctuations of student engagement (as an exception, see Schmidt et al., 2017).

More research is needed to complement the existing literature where the benefits of both approaches are acknowledged. Utilizing both approaches could be particularly valuable when aiming to reach a novel understanding of students' situational engagement. A variable-oriented approach can be used to gain knowledge on how different contextual variables explain the variances manifested in situational engagement. Meanwhile, a person-oriented approach can be

used to identify students who share similar patterns of overall behavioral, emotional, and cognitive engagement, and to continue to examine the extent to which the identified profile groups differ in their situational engagement. These kinds of complementary approaches were employed in the present thesis.

3 THE AIMS OF THESIS

This dissertation was designed to contribute to the field of student engagement by examining the manifestations and correlates of students' situational engagement. As presented in the theoretical background, much is known, for example, about the relevance of engagement for achievement and adaptation outcomes as well the factors that may have a role in shaping student engagement over time. However, the evolving field still has challenges and gaps. One evident gap that most directly led to the present thesis is based on the acknowledged view that students' engagement is not stable; instead, it may fluctuate from one learning situation to another. Although scholars widely agree on this view, empirical evidence confirming and describing situational fluctuation of engagement in authentic classroom settings has been largely missing, and studies employing methods that can capture student engagement at both the situational and overall levels are sorely needed.

Both general and specific aims set for the thesis are presented in Figure 2. The general aims of the thesis addressed theoretical, methodological, empirical, and practical issues. The theoretical aim emphasized the endeavor to reach a deeper understanding of students' situational engagement to strengthen the field. The methodological aim underlined that such knowledge can only be reached by utilizing methods that take into account the hierarchical nested structure in the data. The empirical aim highlighted the need for empirical evidence on factors that contribute to students' situational engagement. Finally, the practical aim focused attention on understanding the ways in which teachers can support students' engagement.

The four general aims resulted in three sub-studies, each with their own specific aims. The first specific aim, *to examine situational variation in student engagement and the factors contributing to this variation*, was addressed within all sub-studies, as each focused on understanding variation in situational engagement as well as the roles that student characteristics or contextual factors have in shaping student engagement. The second specific aim, *to investigate the associations between teacher-student interaction and student engagement*, was addressed in the second sub-study, which concentrated on teacher-student interactions as a contextual

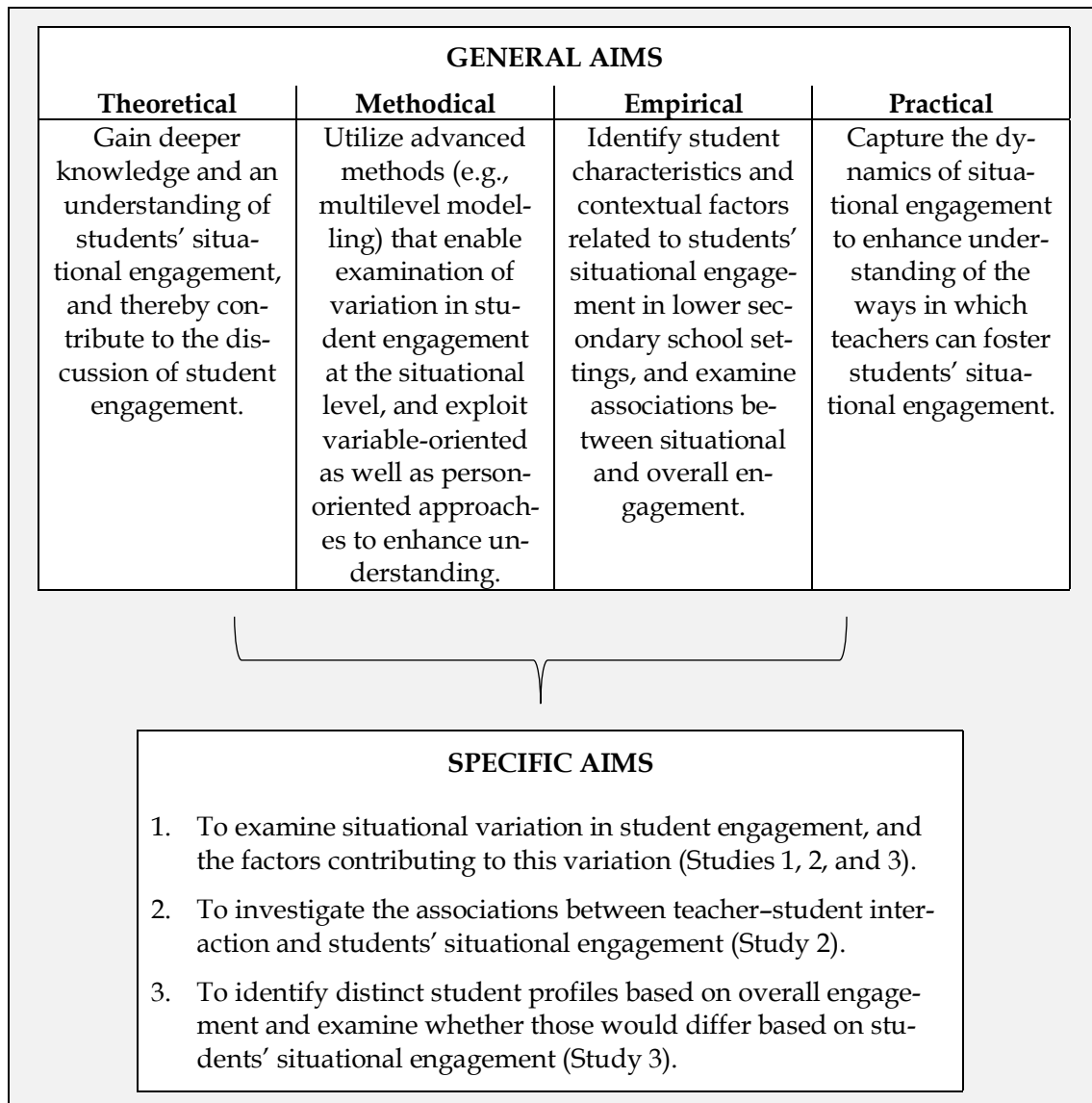


FIGURE 2 General and specific aims of the thesis

factor related to students' situational engagement. The third specific aim, *to identify distinct student profiles based on overall engagement and examine whether those would differ based on students' situational engagement*, was addressed in the third sub-study by employing a person-oriented approach to gain an understanding of the associations between students' overall and situational engagement.

4 METHOD

4.1 Participants

Data for all three sub-studies were drawn from the First Steps study (Lerkkanen et al., 2006–2016), which is a comprehensive age cohort study comprising approximately 2,000 students and their parents and teachers. The participants for the longitudinal study were recruited from four municipalities in different parts of Finland in the year the students turned 6 years of age and entered pre-primary education. The overall aim of the study was to investigate the development of learning and motivation in the contexts of school and home from the pre-primary year up to the end of lower secondary school. The students' guardians provided written consent for their child's participation, and the students and their families were able to withdraw from the study at any point. Written consents were collected from participating teachers and parents as well. All participants were treated according to APA ethical guidelines, and the University of Jyväskylä's Committee of Ethics granted a statement of approval in 2006.

The samples used in the analyses of the present thesis consisted of data collected in spring 2014 when the students were in Grade 7. In Finland, Grade 7 is the first year of lower secondary school, and students attending this grade are, on average, 13 to 14 years of age. Lower secondary school (Grades 7, 8, and 9) comprises the last three years of the nine-year compulsory comprehensive education. In lower secondary school, students are taught by subject teachers who have either a master's degree in the subject they teach as well as 60 credits of pedagogical studies or a master's degrees in education and 60 credits of studies in the subject they teach. Over 98% of Finnish schools are public (Official Statistics of Finland [OSF], 2019b), and class sizes in lower secondary school are relatively small (on average 19.7 students/class; Organisation for Economic Co-operation and Development [OECD], 2016). The samples for each sub-study were drawn from mainstream schools with students attending general education. The samples were representative of the Finnish population with respect to the distribution of maternal education (OSF, 2019a).

The sample for Study 1 consisted of 57 students (24 girls, 33 boys), all of whom participated in a one-week intensive lesson-to-lesson follow-up as part of their normal school days. The sample was selected from two schools by recruiting four classes in which (1) a high percentage of students were participants of the First Steps study, and (2) a high percentage of subject teachers committed to enable the intensive data collection. In one school, the students were asked to rate their situational engagement at the end of all 30 of their weekly lessons, and in the other school at the end of 23 lessons. The data contained 1,328 students' ratings about their situational engagement in the lessons.

The sample for Study 2 consisted of 709 students (338 girls, 371 boys), and 51 of their subject teachers (35 female, 16 male) for language arts and mathematics. The participants came from 26 lower secondary schools enrolled in the First Steps study. The sample of these schools was selected based on teachers' voluntary participation to video-record their classroom lessons. In total, 155 lessons (90 language arts and 65 mathematics) were video-recorded, and students' self-ratings of their situational engagement were obtained at the end of each video-recorded lesson. The data contained 1,624 students' ratings of their situational engagement.

The sample for Study 3 consisted of 301 students (144 girls, 157 boys) from 18 lower secondary schools. The sample was selected based on the number of lessons, after which the students rated their situational engagement. Only students with a minimum of three rated lessons of academic subjects (i.e., mathematics, natural sciences, language arts, foreign languages, and subjects of social studies) were included in the sample. The data contained 1,879 students' ratings of their situational engagement.

An overview of the samples, measures, and methods used in the sub-studies is presented in Table 1 (see p. 39).

4.2 Measures

4.2.1 Situational engagement

Students' situational engagement was measured using the InSituations (InSitu) Instrument (Lerkkanen et al., 2012; Vasalampi et al., 2016). The InSitu Instrument was developed within the First Steps study by adapting insights gained from prior studies measuring situational experiences (Malmberg & Hagger, 2009) and descriptions of relevant constructs from studies and measures in the field of student engagement and motivation (e.g., Archambault et al., 2009; Fredricks et al., 2004; Marchand & Skinner, 2007; Skinner, Kindermann, & Furrer, 2009; Wang et al., 2011).

The InSitu Instrument consists of 17 items rated on a 5-point scale (1 = *not at all*, 5 = *very much*). It has been documented as a valid and reliable self-report instrument for measuring students' engagement in situ (Vasalampi et al., 2016). The psychometric structure of the InSitu Instrument has been established using

exploratory factor analysis (EFA) and confirmatory factor analyses (CFAs) with samples drawn from the First Steps study (Vasalampi et al., 2016). It assesses students' situation-specific experiences through the following five subscales:

- (1) behavioral/cognitive engagement (seven items, e.g., "How persistent were you in studying during the lesson?", "How important did you find the studied content?");
- (2) emotional engagement (three items, e.g., "How much did you like the lesson?");
- (3) disaffection (three items, e.g., "How boring was the lesson?");
- (4) competence experiences (two items, e.g., "How easy was the lesson for you?"); and
- (5) help-seeking (two items, e.g., "How much did you ask for help from the teacher/another adult during the lesson?").

The first two subscales— subscale 1, capturing the combined behavioral and cognitive dimensions, and subscale 2, capturing emotional engagement— represent the key indicators drawn from the tripartite conceptualizations of engagement (see e.g., Wang et al., 2011). The third subscale captures maladaptive behaviors and emotions related to disengagement (see Skinner, Kindermann, & Furrer, 2009). The fourth and fifth subscales focus on facilitators of situational engagement by capturing experiences of competence that are likely to enhance students' engagement with learning (see Connell & Wellborn, 1991; Eccles et al., 1993) and help-seeking as a way to re-engage when needed (see Marchland & Skinner, 2007). As the InSitu measure was constructed, items were created to assess separately all three core indicators of engagement and, in addition, facilitators of engagement. However, the CFAs indicated that students' ratings did not differentiate cognitive and behavioral dimensions; rather, they were intertwined and, hence, combined (Vasalampi et al., 2016).

The situational self-ratings of engagement were carried out using a mobile technology with an application generated for the InSitu Instrument. The application was pre-programmed into smartphones, which were used only for research purposes. The phones were handed out to students immediately at the end of each lesson, and the students were asked to make their ratings based on their experiences concerning that particular lesson. The students used approximately 2–3 minutes at the end of each lesson to rate the items and provide identification information. In Study 1, the first three subscales were included in the analyses, and in Studies 2 and 3, all five subscales with their respective items were included.

4.2.2 Overall engagement

Students' overall engagement was measured using two self-rating engagement measures: the Finnish short version of the Student Engagement Instrument (SEI, Appleton et al., 2006; SEI-F, Virtanen et al., 2016) and the middle school student version of the Rochester Assessment Package for Schools (RAPS; Wellborn & Connell, 1987). Both of these measures have been documented as valid and reliable instruments for measuring students' overall engagement (see Fredricks et al., 2011; Virtanen et al., 2016).

Cognitive and emotional engagement. Students' overall cognitive and emotional engagement were measured using the SEI-F, which consists of 18 items rated on a 4-point scale (1 = *completely disagree*, 4 = *completely agree*). Cognitive engagement comprises two subscales: Control and relevance of schoolwork, and Future aspirations and goals, with items capturing students' sense of control, strategy use, and the value they place on learning and school. Emotional (affective) engagement comprises three subscales: Teacher-student relationship, Peer support at school, and Family support in learning, with items capturing students' sentiments toward school as well as more underlying facilitators leading to emotional engagement, such as experiences of received support. Students' ratings of their overall cognitive and emotional engagement with SEI-F were utilized in Studies 1 and 3.

Behavioral engagement. Students' overall behavioral engagement was measured with the questions drawn from the middle school student version of the RAPS (Wellborn & Connell, 1987). In the First Steps study, five items from the RAPS were used to capture the extent to which students exert effort in their schoolwork, pay attention in class, and prepare for lessons. The items were rated on a 4-point scale (1 = *completely disagree*, 4 = *completely agree*), and a composite mean score was calculated to provide a measure of behavioral engagement. Students' ratings from the RAPS of their overall behavioral engagement were utilized in Study 3.

4.2.3 Teacher-student interaction

Teacher-student interaction was measured by utilizing the observational tool Classroom Assessment Scoring System-Secondary (CLASS-S; Pianta, Hamre, & Mintz, 2012), which is operationalized within the Teaching Through Interaction (TTI) framework. The CLASS-S focuses on effective teacher-student interactions via three main domains and 12 dimensions: Emotional support (three dimensions: Positive climate, Teacher sensitivity, and Regard for adolescent perspectives); Classroom organization (three dimensions: Behavior management, Productivity, and Negative climate); and Instructional support (five dimensions: Instructional learning formats, Content understanding, Analysis and inquiry, Quality of feedback, and Instructional dialogue). The 12th dimension, Student engagement, is an additional dimension that does not belong under any of the three specific domains. (For a description of dimensions, see Table 1 of Study 2). The CLASS-S has been validated in the Finnish context (Virtanen et al., 2017).

In Study 2, 155 lessons were coded with respect to the teacher-student interactions based on video recordings. Each lesson was divided into three observation cycles of approximately 14 minutes each, and each cycle was rated with respect to the 12 dimensions of the CLASS-S on a 7-point scale (Low = 1-2, Mid = 3-5, or High = 6-7). Ratings were averaged across the lesson's cycles. Following the CLASS-S procedure, trained coders performed the codings, and two independent coders double-coded 20% of the lessons. The codings indicated high inter-rater reliabilities ($a_{\text{icc}} = .895$ and $a_{\text{Krippendorff}} = .862$) within the used data.

4.2.4 Other measures

Grades in academic subjects. Students' academic grade point averages (GPAs) were collected from school records at the end of Grade 7. In Finland, grading is guided by the national curriculum guidelines (Finnish national agency for education [OPH], 2004), and the used scale is uniformly from 4 (*fail*) to 10 (*excellent*). The GPAs used in Studies 1 and 3 represents averages of academic subjects (language arts, mathematics, English, Swedish, physics, chemistry, biology, geography, history, religion, and health education).

Tests for academic performance. In Study 3, three group-administered tests were used to assess academic performance. Tests for reading comprehension and reading fluency were part of a nationally normed reading test battery (YKÄ; Lerkkanen et al., 2018). Arithmetic fluency was assessed with the Basic Arithmetic test (Aunola & Räsänen, 2007).

Student characteristics. *Gender* was reported by students via group-administered questionnaires. *Maternal education* level was drawn from parental questionnaires. Level of parental education was divided into three categories: (1) low educational level (i.e., no vocational degree); (2) intermediate educational level (i.e., vocational school degree, vocational college degree, or bachelor's degree); (3) high educational level (i.e., master's, licentiate, or doctoral degree).

Contextual factors. Study 1 utilized information on the subject being studied, the day of the week, and the time of day as situational variables.

4.3 Statistical methods

In Studies 1, 2, and 3, the nested structure of the data was taken into consideration by using multilevel modeling which takes into account the hierarchical nature of data when needed (see e.g., Hox, 2010). The analyses were carried out using the Mplus statistical package (versions 7.4–8.4, Muthén & Muthén, 1998–2017), and the SPSS Package (versions 22–24, IBM Corp.).

Study 1. A two-level hierarchical multivariate model with the robust maximum likelihood (MLR) as the estimator was applied in Study 1. At the *between-students level*, the extent to which students' gender and GPA predicted variations in student's situational engagement was examined. The extent to which structural factors (the subject being studied, the day of the week, and the time of day) predicted the variation in situational engagement was examined at the *within-students-between-lessons level*. Detailed results were drawn by utilizing paired comparisons. In addition, intra-class correlations (ICCs) within the day, between days within the week, and between students were employed to determine situational variation of engagement.

Study 2. Cross-classified multilevel modeling with a Bayesian estimator (see Fielding & Goldstein, 2006) was applied in Study 2. At the *within level*, the extent to which the observed teacher–student interactions (i.e., emotional support, classroom organizations, and instructional support) predicted variations in students'

situational engagement was examined. At the *between students* and *between teachers* levels, the extent to which the student's gender predicted variations in situational engagement was examined and the effects of the subject being studied were controlled. Due to high correlations between the three CLASS-S domains (Emotional support, Classroom organization, and Instructional support), each domain was modeled separately, leading to three similar but independent models. In addition, proportions of variances for situational engagement and observed teacher-student interactions were calculated.

Study 3. A series of statistical analyses were conducted in Study 3. First, a person-oriented approach with latent profile analysis (LPA; Vermunt & Magidson, 2002) was applied to identify subgroups of students with similar patterns of overall engagement. Second, multinomial regression analyses and pairwise comparisons with the Mplus three-step approach were used to compare subgroups with respect to students' backgrounds (gender and maternal educational level) and academic performance (GPA, reading comprehension, reading fluency, and arithmetic fluency). Finally, comparisons between subgroups with respect to students' situational engagement were conducted with two-level models using the MLR as the estimator. In each of the models, the *within level* modeled variations within individuals, while the *between level* modeled the extent to which the identified subgroups predicted the variations in situational engagement. Paired comparisons with Wald tests of parameter constraints were conducted at the between level.

TABLE 1 Overview of samples, measures, and methods used in the sub-studies

Sub-studies	Sample	Variables	Statistical methods
Study 1			
Variation in situation-specific engagement among lower secondary school students	57 students (Grade 7) participating in a one-week intensive lesson-to-lesson follow-up. Total of 1,328 ratings for situational engagement.	Situational engagement <i>InSitu Instrument</i> Contextual factors <i>School subject; day of the week; time of day</i> Academic performance GPA Student characteristics <i>gender</i>	Two-level hierarchical multivariate model ICCs
Study 2			
Teacher-student interaction and lower secondary school students' situational engagement	51 subject teachers' (language arts and mathematics) video-recorded lessons. Total of 155 lessons coded for observed teacher-student interaction. 709 students (Grade 7) rating their situational engagement at the end of the video-recorded lessons. Total of 1,647 ratings for situational engagement.	Situational engagement <i>InSitu Instrument</i> Observed teacher-student interactions <i>CLASS-S</i> Student characteristics <i>gender</i>	Cross-classified multi-level models
Study 3			
Adolescents' engagement profiles and their association with academic performance and situational engagement	301 students (Grade 7) with a minimum of three rated lessons in academic subjects. Total of 1,879 ratings for situational engagement.	Situational engagement <i>InSitu Instrument</i> Overall engagement <i>SEI-F; RAPS</i> Academic performance <i>GPA; tests for reading comprehension, reading fluency, and arithmetic fluency</i> Student characteristics <i>gender; maternal education</i>	Latent profile analysis Two-level multinomial regression models

5 OVERVIEW OF THE ORIGINAL STUDIES

5.1 Study 1: Variation in situation-specific engagement among lower secondary school students

The aim of Study 1 was to investigate situational variation in students' engagement, and to determine the extent to which this variation could be predicted by student's academic achievement, and structural factors of school subject, and the time of day. An intensive one-week lesson-to-lesson data collection was conducted in four Grade 7 classes. During the school week, the students ($N = 57$) rated their situational engagement using the InSituations (InSitu) Instrument (Lerkkanen et al., 2012) at the end of several lessons, providing a total of 1,328 time-stamped ratings. The extent to which students' engagement varied from one lesson to another (intra-individual variation) and between students (inter-individual variation) were analyzed with ICCs. Associations between situational engagement and GPAs, school subjects, and time of the lessons were analyzed with two-level hierarchical multivariate modeling.

The ICCs revealed high intra-individual variation in students' situational behavioral/cognitive engagement, emotional engagement, and disaffection between lessons, which confirmed that students' engagement varies situationally from one lesson to another. Furthermore, the two-level hierarchical multivariate model showed that students' academic achievement was not associated with their ratings of situational behavioral/cognitive and emotional engagement, whereas the more situational disaffection they reported the lower was their academic achievement. The results, thus, suggest that students with higher GPAs tend to experience disaffection to a lesser extent than do students with lower GPAs.

With respect to school subject and time, the two-level multivariate model showed that variation in situational engagement could be predicted by the subject of the lesson. Pairwise comparisons testing differences in situational behavioral/cognitive engagement, emotional engagement, and disaffection between

different subjects suggested that students reported the highest situational behavioral/cognitive and emotional engagement and the lowest disaffection in non-academic subject lessons (e.g., physical education and home economics), whereas the lowest situational behavioral/cognitive and emotional engagement and the highest disaffection were reported in academic subject lessons (e.g., mathematics).

To conclude, the results highlighted that students' engagement varies from one lesson to another. It also extended the prior literature by specifying some of the factors that are related to this situational variation. The findings suggest that teachers' active support of student engagement is particularly needed in academic subjects, and more attention should be given to fostering the situational engagement of low-achieving students.

5.2 Study 2: Teacher–student interaction and lower secondary school students' situational engagement

The aim of Study 2 was to examine the associations between teacher–student interactions and students' situational engagement, and whether those possible associations would be similar for girls and boys. Using the CLASS-S (Pianta, Hamre, & Mintz, 2012), trained coders coded 155 video-recorded lessons (90 language arts and 65 mathematics) taught by 51 subject teachers. The students ($N = 709$) rated their situational engagement with the InSitu Instrument (Lerkkanen et al., 2012) at the end of each video-recorded lesson, providing a total of 1,647 time-stamped ratings. As the data were nested in both, students and teachers, the data were analyzed with cross-classified multilevel models.

The results showed that the quality of teacher–student interactions was associated with students' situational engagement. The findings suggested, first, that higher emotional support in the lesson was related to students' higher situational emotional engagement and help-seeking; and second, that higher classroom organization was positively related to students' higher situational behavioral/cognitive engagement. In addition, the results suggested that boys reported higher levels of situational disaffection and help-seeking than girls did, and girls reported higher levels of situational behavioral/cognitive engagement than boys did. Furthermore, the results revealed one significant interaction effect, suggesting that girls were more inclined to respond with higher situational emotional engagement in the presence of high emotional support in teacher–student interactions compared to boys.

To conclude, the results provided unique empirical evidence, proposing that students' situational engagement can be fostered via supportive teacher–student interactions. Understanding the role of emotional support and its different effects on the engagement of boys and girls is particularly important for teachers' instructional practices.

5.3 Study 3: Adolescents' engagement profiles and their association with academic performance and situational engagement

The aim of Study 3 was to identify subgroups of students with similar patterns of overall engagement utilizing a person-oriented approach, and to examine how those subgroups would differ from each other in terms of academic performance and situational engagement. A series of analyses, including latent profile analysis with a three-step procedure, multinomial regression models, and two-level hierarchical multivariate models, was carried out with a sample of 301 Grade 7 students. The students rated, first, their overall engagement with two self-rating measures. In addition, they rated their situational engagement with the InSitu Instrument (Lerkkanen et al., 2012) after a minimum of three independent lessons. The data included students' ratings of their overall engagement and a total of 1,879 time-stamped ratings of their situational engagement.

The latent profile analysis identified four subgroups. Three of the subgroups showed concordant patterns across the subscales that were used to capture students' overall behavioral, emotional, and cognitive engagement. According to the levels of overall engagement, the groups were named as High-Overall-Engagement (*High-OE*, 29.5%), Low-Overall-Engagement (*Low-OE*, 4.7%), and Mid-Overall-Engagement (*Mid-OE*, 37.9%). The fourth profile group, Mid-Overall-Engagement-with-High-Future-Goals (*Mid-OE+High-FG*, 27.9%), did not show a concordant pattern; instead, it was somewhat similar to the Mid-OE profile except for the high values for future aspirations and goals. The four subgroups were compared with one another with respect to their ratings of situational engagement.

The analysis using two-level models with pairwise comparisons showed that students in the High-OE profile group showed the highest situational behavioral/cognitive and situational emotional engagement, whereas those in the Low-OE profile group showed the lowest. Students in the Mid-OE and Mid-OE+High-FG profile groups differed from each other with respect to their situational emotional engagement, but no differences between them emerged in terms of their situational behavioral/cognitive engagement. The findings indicated also that students in the High-OE profile group reported systematically lower situational disaffection when compared to students in the Low-OE, Mid-OE, and Mid-OE+High-FG profile groups, but the three latter groups did not differ from one another in terms of their situational disaffection. Furthermore, the results indicated that students in the High-OE and Mid-OE+High-FG groups showed somewhat larger intra-individual variations in their situational emotional engagement and smaller intra-individual variation in their situational disengagement than did students in the Low-OE or Mid-OE groups.

Taken together, the results showed that while overall and situational engagement are related, the relation may be somewhat different for the subgroups of students. The results highlighted the importance of providing support for students with low overall engagement but also for students with relatively moderate

levels of overall engagement. The study also emphasized the meaningful role of future aspirations and goals might have when providing support for student engagement at school.

6 GENERAL DISCUSSION

The existing literature has shown that engagement plays a significant role in students' academic learning (e.g., Appleton et al., 2008; Fredricks et al., 2004). Students' engagement is seen to be formed in transaction with the contexts in which they study and learn (e.g., Wang et al., 2019), and the current views also acknowledge that students' engagement may fluctuate from one learning situation to another (Eccles & Wang, 2012; Skinner, Kindermann, & Furrer, 2009). However, empirical studies shedding light on this fluctuation are scarce; thus, more studies confirming and describing engagement at its situational level, are needed. The present thesis contributes to the growing field of student engagement by moving beyond knowledge gained by focusing on students' typical engagement over time (i.e., overall engagement) to a parallel examination of situational engagement and its fluctuation.

Theoretically, the thesis aimed to elucidate the fluctuation of students' situational engagement and its association with overall engagement and contextual factors. With respect to the methodological aim, the thesis set out to analyze the associations between students' situational engagement and different factors by utilizing methods that allowed analysis at several levels and the use of the person-oriented and variable-oriented approaches. The empirical focus was on identifying student characteristics, contextual factors, and components of overall engagement associated with variations in situational engagement. The practical aim of the thesis was to use the understanding gained from the findings to inform teachers and other education practitioners of the ways by which teachers could most effectively support their students' overall and situational engagement.

The central focus of all three sub-studies was on situational engagement and its variation, which led to three overarching findings. First, the results provided further empirical evidence of how examining student engagement at its situational level can achieve a greater understanding of how engagement is shaped in the classrooms. Second, the findings enhanced the understanding of student characteristics and contextual factors associated with students' situational engagement. Particularly salient were the findings describing how the

quality of teacher–student interaction can shape students’ situational engagement. Third, the results revealed novel empirical information on the associations between overall and situational engagement. A critical element that provided a solid basis for these three overall contributions of this thesis was the use of analysis, which were able to both capture and break down the factors affecting engagement at its situational level. The findings also enriched and boosted the field of student engagement by expanding the knowledge about the qualities of classroom interactions and participatory practices, which may in turn be used by teachers and other education practitioners when providing support to students who have weak ties to the school.

6.1 Theoretical and empirical contributions

6.1.1 Providing evidence on the added value of examining student engagement at its situational level

While the existing literature provides theoretical reasoning and some empirical evidence advocating the examination of student engagement at its situational level (e.g., Lawson & Lawson, 2013; Martin et al., 2015), the majority of studies in the field of student engagement still mostly measure engagement at its overall level by utilizing, for example, self-reports of students’ perceptions of their typical engagement across time. Research that aims to capture situational variation of engagement has only begun to take its place in the field of student engagement. The present thesis joins this emerging line of research and provides evidence on the contextual and individual factors associated with situational engagement assessed with respect to experiences in authentic classroom lessons.

To capture students’ situational engagement in each sub-study, the InSitu Instrument was used to collect the data. The findings highlight the added value of examining situational engagement in three ways. First, each sub-sample demonstrated intra-individual variation in students’ situational engagement (as shown by significant ICCs). In Study 1, for example, intra-individual variation from one lesson to another was demonstrated among students who assessed their situational engagement repeatedly at the end of most of their lessons during one school week. The findings corroborated those of prior research showing situational variation in students’ engagement between lessons (e.g., Martin et al., 2015) and strengthened the view that student engagement fluctuates from one learning situation to another. Second, the findings obtained in Study 1 and Study 2 documented that intra-individual variation in students’ situational engagement is associated with contextual factors. The present thesis concentrated only on a few selected contextual factors considered central to situational variation in engagement; however, the findings supported the assertion made by Skinner, Kindermann, and Furrer (2009) that engagement is formed in transaction, which involves different school subjects and fluctuating social contexts. Third, the find-

ings gained in Study 3 indicated that students' overall and situational engagement are associated, but the association is not similar for each student or for subgroups of students. These findings complement prior theoretical arguments suggesting associations between overall and situational engagement (Lawson & Lawson, 2013). At the same time, the findings highlight the need for empirical evidence based on simultaneous data collection at both the situational and overall levels. Taken together, the present thesis strengthens the field of student engagement by providing concrete evidence endorsing the importance of examining student engagement at the situational level along with the overall level.

6.1.2 Enhancing understanding of factors related to situational engagement

A specific attempt was made to investigate different factors associated with students' situational engagement. All three sub-studies examined the intra-individual situational variation in student engagement and the factors contributing to such variation. In Study 2, specific attention was given to the associations between teacher–student interactions and students' situational engagement. As the findings provided insights into the roles that specific student characteristics and contextual factors play in shaping students' situational engagement, the second contribution of the present thesis is increased understanding of the interactional and individual factors related to situational engagement.

Student characteristics

Because previous studies have indicated that, on average, girls report higher engagement than boys do (e.g., Lam, Jimerson, et al., 2012), the potential for gender differences was considered within each sub-study. A number of previous studies on overall engagement have reported gender differences when student engagement measures have included composite scores created across behavioral, emotional, and cognitive engagement (e.g., Lam, Jimerson, et al., 2012) as well as when analyzing different dimensions of engagement separately (e.g., Rimm-Kaufmann et al., 2015 for cognitive engagement; Skinner, Kindermann, & Furrer, 2009; Wang et al., 2011 for behavioral and emotional engagement). In addition, gender differences have emerged in previous studies measuring engagement and disengagement using separate scales at the overall level as findings have suggested higher behavioral and emotional disaffection for the boys than the girls (e.g., Skinner, Kindermann, & Furrer, 2009). To reach in-depth understanding on gender differences in situational engagement in the present thesis, gender differences were examined separately for each InSitu subscale, capturing both the indicators (behavioral/cognitive and emotional engagement, and disaffection) and the facilitators (competence experiences and help-seeking) of situational engagement.

The findings of the thesis revealed that there were some gender differences in students' situational engagement, but they were not consistently found across all the subscales. The results indicated that boys reported, on average, lower levels of situational behavioral/cognitive engagement and higher levels of situational disaffection and help-seeking compared to girls (Study 2). Therefore, as an

important addition to the prior literature on overall engagement, the present findings corroborated the gender differences at the situational level for behavioral/cognitive engagement but not for situational emotional engagement. Thus, findings runs partly contrary to the previously documented gender differences at the overall level (cf. Wang et al., 2011). It seems that while students' sentiments toward school and learning at the overall level tend to be more positive among girls than among boys, girls did not differ from boys in terms of their situational ratings of their enjoyment of the lesson, although they reported lower disaffection (e.g., experiences of boredom) than the boys. This could perhaps be explained by a mechanism where higher overall emotional engagement acts as a protective factor against maladaptive behaviors and affective states at the situational level, but at the same time, it does not determine students' experiences of situational emotional engagement.

Novel insights with respect to the associations between maternal educational level and students' situational engagement could be drawn based on the findings gained in Study 3. The results suggested that students belonging to the group with higher maternal education level reported significantly higher levels of situational emotional engagement and competence experiences and lower situational disaffection than students who belonged to the group with a lower maternal education level. However, any causal inferences that the maternal education level will directly shape students' situational engagement naturally cannot be drawn. These findings may suggest, however, that among some students, family socioeconomic status may act as a risk for lower situational engagement. Such suggestion have been proposed previously for students' overall engagement as well (e.g., Li & Lerner, 2011; Linnakylä & Malin, 2008).

Taken together, the findings of the present thesis complement the existing literature on student engagement by showing that student characteristics play a role in shaping students' situational engagement. Despite the somewhat inconsistent relations across the different subscales, the present findings highlight, first, the importance of acknowledging the role of student characteristics in shaping students' situational engagement and incorporating this in the research examining student engagement at the situational level. Second, the findings revealed that lessons may often be experienced differently by boys and by girls with respect to their behavioral/cognitive engagement and disaffection, and this should be taken into account in school practices. It seems particularly important to recognize boys' higher risk of situational disaffection so that they can be provided with motivational support through participatory activities and study modes.

Contextual factors

Theoretical models guiding the understanding of student engagement have set different contextual factors in the pivotal role of shaping students' experiences of engagement (see Connell & Wellborn, 1991; Eccles et al., 1993). While the main focus of the thesis was on examining the role of teacher-student interaction in shaping students' situational engagement, the effects of school subjects and the time of lessons with respect to the day and week were also of interest, because

they provide structural variations from one lesson to another within a school days.

The findings of the thesis indicated that students' situational engagement is associated with the subject being studied in the lesson but not with the time of the lesson (Study 1). In line with the prior findings documenting higher student attention, interest, and enjoyment in lessons of non-academic subjects than academic subjects (Shernoff et al., 2003), the present findings showed that students were most likely to experience higher situational behavioral/cognitive and emotional engagement as well as lower situational disaffection in home economics and physical education lessons than in lessons of academic subjects. With respect to academic subjects, students reported higher situational behavioral/cognitive engagement in English and science lessons than mathematics lessons, but no other differences emerged between among the other academic subjects. Therefore, these findings indicate that the role that school subjects play in shaping students' situational engagement should not be discounted, in particular, with the different roles of academic and non-academic subjects. Perhaps understanding on the role of different subjects could be further examined by approaching them from a perspective of productive disciplinary engagement (PDE; Engle & Conant, 2002) which is a framework seeking to capture engaged learning of disciplinary concepts and practices (Mayer, 2014; Nolen et al., 2015; Vauras et al. 2019).

The findings of the present study indicated that the situational fluctuation of engagement is not systematically dependent on the frequently changing structural factors such as the time of day of the lesson or even the specific disciplinary subject involved (apart from the academic vs. non-academic divide). Thus, it seems that more attention should be given to the role that teachers and also peers play in shaping situational engagement. The self-system process model (Connell & Wellborn, 1991) and the stage-environment fit perspective (Eccles et al., 1993) suggest that engagement is related to opportunities that students have to fulfill their fundamental psychological needs of competence, autonomy, and relatedness. While some school subjects may provide students with opportunities to meet such needs more easily, the findings of the present thesis indicate that teachers' instructional and interactional practices cannot be overlooked (see also Eccles & Roeser, 2009). Teachers hold a role that sets them apart in providing an optimal position to influence their students' engagement in every lesson that they teach. Consequently, teachers should be prepared to invest time and effort in providing the most optimal support for their students' situational engagement.

Prior literature indicates that teachers can influence their students' engagement, for example, via caring teacher-student relationships and interactions that endorse clear and appropriate expectations, and by choosing and currying out instructional practices that match the students' needs (e.g., Appleton et al., 2006; Lam et al., 2016; Roorda et al., 2017; Virtanen et al., 2013). Guided by this evidence, the present thesis examined the role that teachers play in shaping their students' situational engagement by concentrating on the quality of emotional support, classroom organization, and instructional support in teacher-student interactions (i.e., by utilizing the domains within the TTI framework; e.g., Hafen et al.,

2015; Hamre et al., 2013). To obtain fine-grained information on students' situational engagement, analyses were carried out separately for each subscale, capturing the indicators and facilitators of situational engagement throughout the thesis.

The findings of the thesis indicated that the quality of emotional support in teacher–student interactions was positively related to students' situational emotional engagement and help-seeking, and that the quality of classroom organization was positively related to students' situational behavioral/cognitive engagement (Study 2). The interaction effect found with respect to emotional support and gender suggested that a higher quality of emotional support was particularly beneficial for girls' situational emotional engagement. With respect to the quality of instructional support, no significant relation with students' situational engagement emerged.

As the literature does not contain any prior studies examining the associations between teacher–student interactions and the self-reported situational engagement of lower secondary school students', the present findings made a unique contribution to the field by providing novel insights into such associations. Complementing the previous literature suggesting associations between students' overall engagement and observed classroom emotional support (e.g., Reyes et al., 2012), the present findings imply that it is likely that teachers influence their students' emotional engagement at the situational level by building the basis for warm and respectful interactions where students' needs are met. In addition, prior findings documenting a positive relation between the quality of classroom organization and students' overall behavioral engagement (Virtanen et al., 2013) were complemented with corresponding finding at the situational level. It was shown that students' situational behavioral/cognitive engagement was associated with the observed classroom quality for the same lessons, which suggests that this dimension of situational engagement, in particular, is supported by consistent behavioral expectations and well-regulated efficient classroom environments.

However, despite these converging results, one should be cautioned against assuming that the quality of teacher–student interaction would always contribute to students' situational and overall engagement in an identical fashion. First, at the situational level, emotional support is transmitted only to situational emotional engagement and help-seeking, whereas at the overall level, emotional support (or its independent dimensions) has been found to support students' cognitive engagement as well (McKellar et al., 2020; Rimm-Kaufmann et al., 2015). In addition, in the present study observed instructional support was not related to the students' self-reported situational engagement, whereas association between instructional support and students' overall behavioral engagement have been reported previously (Virtanen et al., 2013). Therefore, it seems that while the quality of teacher–student interaction plays a significant role in shaping students' situational experiences, it is perhaps also the continuity over time that places teachers in a position from which they can make a difference in students' overall engagement.

Taken together, the findings of the present thesis highlight that student engagement is formed in transaction with different contextual factors. A major theoretical contribution of the thesis is that it provided a strong evidence of the key role that the quality of teacher–student interaction plays in the process of shaping students’ situational engagement. The present findings emphasize the importance of being attentive to students’ needs and responding to these, and of having consistent expectations throughout every lesson of every day. This kind of sensitivity and regard for students’ needs may seem simple to achieve for qualified, professional teachers, but setting these goals as a priority within each lesson of each day does require the expertise and reflection on one’s development as a teacher.

6.1.3 Revealing associations between overall and situational engagement

To complement the research findings obtained by focusing on either situational or overall engagement, the present thesis sought to throw light on the associations between the two. Such associations were investigated by utilizing a person-oriented approach to identify distinct student profiles based on students’ overall behavioral, emotional, and cognitive engagement, and then examining whether those profile groups differ from one another based on students’ situational engagement (Study 3). The following four distinct profile groups were identified: High-Overall-Engagement (*High-OE*, 29.5%), Low-Overall-Engagement (*Low-OE*, 4.7%), Mid-Overall-Engagement (*Mid-OE*, 37.9%), and Mid-Overall-Engagement-with-High-Future-Goals (*Mid-OE+High-FG*, 27.9%). The first three of these profile groups displayed concordant patterns across the domains of overall engagement, but the last one represented students with somewhat similar overall engagement as in the *Mid-OE* profile group, except for their high future aspirations and goals.

Increased understanding of the associations between overall and situational engagement was derived by examining the differences in students’ situational engagement between profile groups. The findings suggested, first, that students who were identified as having relatively high or low levels of overall engagement, reported levels of situational engagement that matched their overall engagement. However, the findings also revealed that similar association between overall and situational engagement was not present among profiles with relatively moderate overall engagement (i.e., students in the *Mid-OE* and *Mid-OE+High-FG* profile groups). For instance, with respect to students’ situational behavioral/cognitive engagement, the *Mid-OE* and *Mid-OE+High-FG* profile groups did not differ from each other. This finding was rather surprising, as one of the defining differences between these two profile groups at the overall level centered on aspects of cognitive engagement (i.e., future aspirations and goals; see more Appleton et al., 2008). Although future aspirations and goals have previously been reported to correlate with situational behavioral/cognitive engagement (Vasalampi et al., 2016), the current findings suggest that this connection does not hold for every student. While this finding can be partly due to the merging behavioral and cognitive engagement into one scale at the situational level, the finding highlights

that it should not be assumed that all students would experience corresponding levels of situational and overall cognitive engagement. In sum, the findings of the thesis indicated that overall and situational engagement are associated but the associations are not uniform for all students.

The thesis also revealed a relevant finding concerning students' situational disaffection. The results indicated, as expected, that the students who reported the highest levels of overall engagement (i.e., students in the High-OE profile group) also reported significantly lower levels of situational disaffection than did students in the other profile groups. However, somewhat unexpectedly, the remaining three profiles, Low-OE, Mid-OE, and Mid-OE+High-FG, did not significantly differ from one another in their situational experiences of disaffection. In contrast to the previously reported correlations between students' situational disaffection and the subscales of overall emotional and cognitive engagement (Vasalampi et al., 2016), the present study indicated that this linkage exists only among some students. These findings can be interpreted to mean that the high overall engagement of a student can be a protective factor against situational experiences of disaffection. However, as lower or moderate levels of overall engagement did not explain the level of situational disaffection, it may be that situational disaffection is determined by very unique factors in the lesson or, for example, in the students' state of mind or level of attentiveness.

Further understanding of the associations between overall and situational engagement was gained through the findings on the profile group differences in intra-individual variation with respect to students' situational emotional engagement and disaffection. Ratings of students in the High-OE and Mid-OE+High-FG profile groups indicated more variance in situational emotional engagement between lessons than those of students in the Mid-OE profile group, and, in turn, ratings of students in Low-OE profile group indicated less variance in their situational emotional engagement than students in the Mid-OE group. Therefore, the present findings provide a unique view by looking at the profile group differences in students' intra-individual variance and suggest that students with higher levels of overall engagement might be somewhat more responsive to the changes in lessons. Regrettably, these findings can also suggest that students with lower levels of overall and situational engagement seem to have less variance in their situational engagement, which may indicate also low responsiveness to the contextual changes intended to support their engagement and participation in the classroom.

Taken together, the findings provided empirical evidence supporting prior theoretical suggestions that overall and situational engagement are associated (Lawson & Lawson, 2013; Skinner, Kindermann, & Furrer, 2009). The present findings can be taken to suggest that the level of overall engagement may contribute to the level of situational engagement. However, examining these associations is an understudied area. Thus, while the present thesis provides a valuable contribution to the literature on student engagement by empirically showing the associations between overall and situational engagement, further empirical re-

search, such as one using a longitudinal design, is needed to increase understanding of the mechanism of such associations. In addition, as student engagement has been characterized as malleable (e.g., Fredricks et al., 2004; Skinner, Kindermann, & Furrer, 2009), studies examining how students' experiences of situational engagement accumulated over time and are transferred back to overall engagement are needed (see Lawson & Lawson, 2013).

6.2 Methodological contributions

Prior literature has emphasized that researchers in the field of student engagement should use methods that lead to robust theoretical understanding of student engagement (Fredricks & McColskey, 2012; Lawson & Lawson, 2013; Lawson, 2017; Sinatra et al., 2015). In line with the overall methodological aim, each sub-study employed students' assessments of their lesson-specific situational engagement collected at the end of the lessons, which enabled analyzation of intra-individual variation (see Hamaker, 2012). Both variable-oriented and person-oriented approaches were utilized in order to gain knowledge on how different contextual variables explain variance in situational engagement, but also in order to examine different profiles of engagement to capture association between students' overall and situational engagement (see also Lawson & Lawson, 2013).

The following methodological implications can be suggested based on the present thesis. First, the thesis provided empirical evidence for a clear distinction between the two levels of student engagement. The findings concur that methodological approaches used to capture student engagement at the overall and the situational level provide a unique view of student engagement, and, therefore one level cannot be replaced by the other (see also Lawson, 2017). Second, in Study 2, cross-classified modelling was used as the data were nested in both the students and the teachers (i.e., one subject teacher taught more than one group of students, and one group of students was taught by more than one subject teachers). Findings from the cross-classified analyses were able to reflect the complex reality of students' lives in school. While employing cross-classified designs in the educational research is rare to date, the use of such designs should be considered when analyzing data in which teachers and students within their classes are confounded (see Mainhard et al., 2018). Third, similar to what has been reported earlier in the field of student engagement (e.g., Lawson & Masyn, 2015; Li & Lerner, 2011; Wang & Peck, 2013), the present thesis highlights the importance of utilizing a person-oriented approach along with the more traditional variable-oriented approach. When aiming to foster student engagement, it is important to acknowledge that components of engagement constitute different profiles, and subgroups of students may have both different antecedents and repercussions in the development of engagement. Finally, the results highlighted the value of parallel assessments of situational and overall engagement in the same sample of students. Such designs enables the increased understanding of the mechanisms

through which situational as well as overall engagement are molded (see also, Lawson & Lawson, 2013).

While the aims of the thesis did not directly touch upon the debate of whether engagement and disengagement should be seen as opposite ends of the same construct or separate constructs (see for a review, Reschly & Christenson, 2012), the present findings provided some evidence on this issue. The unique findings suggesting differences in associations between situational disaffection and overall engagement between profile groups support the view of conceptualizing and examining engagement and disengagement as distinct constructs (see also, e.g., Skinner, Kindermann, & Furrer, 2009; Wang et al., 2019). Therefore, based on the present findings, future studies should consider assessing engagement and disengagement with separate scales at both the overall and situational levels.

6.3 Practical implications

The key messages that the findings of this thesis convey to schoolteachers builds on the notion that there is variation in students' situational engagement. While intra-individual variation in students' engagement has already been suggested in previous literature (e.g., Martin et al., 2015; Skinner, Kindermann, & Furrer, 2009), and to some extent, this is also a common perception among teachers and other adults who spend time with students in the school setting, the present thesis provides a crucial reminder of the lesson-to-lesson fluctuations in engagement. It also delivers a view that students' typical behavioral, emotional, and cognitive engagement in learning (i.e., whether they report high, low, or moderate levels of overall engagement) cannot fully predict these situational fluctuations. In general, the findings suggest that emphasis should be given to the notion that each lesson holds a promise for students to become more engaged, and teachers play a powerful role in scaffolding learning in versatile, autonomous, and supportive ways. This understanding, which underscores teachers' sensitivity to students' needs and their varying motivational and achievement profiles, is the underlying basis for the following practical suggestions.

The present thesis provides several practical implications informing the ways in which teachers can foster students' situational engagement in ordinary lessons. The findings suggested, for example, that boys are generally in greater need of receiving timely and optimally tailored support for their situational engagement compared to girls. Similar suggestions have been given with respect to students' overall engagement in the previous literature (Lam, Jimerson, et al., 2012; Wang et al., 2011). While gender is a stable characteristic and most teachers may certainly attest to some differences between boys' and girls' attentiveness, for instance, raising awareness of addressing the needs of both genders with respect to the person-environment fit of classroom practices is critical for teacher education.

The findings indicated that students with relatively low or moderate levels of overall engagement reported comparable levels of situational disaffection. This finding is particularly intriguing, because previous literature on overall engagement has highlighted the importance of providing support for students with low engagement or high disengagement (e.g., Archambault et al., 2019; Finn & Zimmer, 2012). Appleton (2012), for example, have suggested that when engagement is assessed throughout the school district, students who score within the lowest 10% should be identified in order to find ways to promote their engagement. The present findings, however, raise the important notion that it is not only those who are identified with low overall engagement who need support, but also those with moderate levels of overall engagement. In the present sub-sample, those two groups represented almost 43% of the participating students.

As student engagement is acknowledged for having various positive outcomes (e.g., Archambault et al., 2019; Fredricks et al., 2004), researchers and practitioners are constantly seeking ways to enhance students' engagement. Prior literature has demonstrated that engagement can be supported via targeted interventions, and several examples of useful and important ones can be found (see for a review, e.g., Archambault et al., 2019). The aim of the present thesis was, however, to provide research-based suggestions on the ways in which teachers could foster students' situational engagement within their lessons. Therefore, acknowledging the role that the quality of teacher-student interaction play in shaping students' situational engagement is a focal practical implication of the present thesis.

To conclude, the findings showing a link between students' situational engagement and observed classroom interaction suggest that emotionally supportive learning environments can promote students' situational emotional engagement. This was found to be particularly beneficial among girls. In addition, the findings suggest that students' situational behavioral/cognitive engagement may benefit from consistent behavioral expectations and well-regulated efficient classroom environments. Therefore, the findings of this thesis suggest that striving for warm and caring teacher-student relationship in which students' academic, social, emotional, behavioral, and developmental needs are met, is something that every teacher could and should attempt within each lesson. In addition, constant emphasis should be given to how teachers encourage desirable behavior and effectively provide opportunities for students to learn. The findings further revealed that students' future aspirations and goals were positively associated with their situational engagement. This finding aligns with prior evidence highlighting the importance of future goals (e.g., Hill & Wang, 2015; Simons et al., 2004), which suggests that teachers should acknowledge that reflecting on students' future aspirations and goals can be a powerful tool and facilitator of students' situational engagement.

6.4 Ethical considerations

The Finnish National Board on Research Integrity TENK (2009, 2019) provides ethical guidelines for responsibly conducted research. The present thesis followed the following three general ethical principles: 1) respecting the autonomy of research participants, 2) avoiding harm, and 3) ensuring privacy and data protection (TENK, 2009). The thesis and its data collection were conducted under the larger longitudinal First Steps study, for which the Committee of Ethics of the University of Jyväskylä had given a statement of approval concerning the ethics of the study after its ethical review in June 2006.

Aligning with the guidelines given in the ethical principles for studies in the human sciences in Finland (TENK, 2019), participation in the study was voluntary, and written consents were collected from the students' guardians for their child's participation, and from participating teachers and parents for their own participation. The participants were able to discontinue their participation or withdraw their consent at any time, and the participants received information on the content and aims of the research, the ways personal data would be processed, and on the practical implementation of the research (see TENK, 2019). Identifying information (e.g., names of participating students, teachers, and parents as well as schools and classrooms) were anonymized through the allocation of codes. In addition, guardians of the participating children were asked if they wanted their child's image to be blurred in the video recordings (see TENK, 2009). Data were stored and treated in accordance with the guidelines of the University of Jyväskylä. Moreover, as the participating students were under 15 years of age at the time of data collection, specific attention was paid to acknowledging that minors were involved in the research (TENK, 2019). The participants' privacy has been carefully protected in research publications and the thesis.

6.5 Limitations and future directions

Some limitations regarding the data and research methods need to be taken into account when interpreting the findings and considering their generalizability or future research. First, the data on student engagement at both the situational and overall levels were based on students' self-ratings. While self-rating methods are well suited for this kind of research, it is possible that data could include some cases in which students chose answers that they believed were the preferred ones, instead of being completely honest or realistic (see Fredricks & McColskey, 2012; Hofkens & Ruzek, 2019). In future studies, teacher-rated or observed data could complement self-reports with respect to some components of students' situational and overall engagement (e.g., behavioral engagement).

In addition, it should be noted that while the measure used to assess student engagement at the situational level (i.e., InSitu Instrument; Lerkkanen et al., 2012) has been documented as a valid and reliable self-report instrument for measuring

students' engagement in situ (Vasalampi et al., 2016), it has not yet been widely used in previous research. Moreover, based on psychometric reasons, the items designed to capture behavioral and cognitive engagement had to be merged under one subscale. Although this merger of two components or subscales was not completely unexpected, based on previous research showing a link between different aspects attached to behavioral and cognitive engagement (e.g., Reschly & Christenson, 2012), future studies should seek ways to distinguish between these two core components of student engagement at the situational level.

It is also worth noting that the student characteristics and contextual factors that were included in the present thesis represent only a small selection of the potentially relevant factors that may contribute to shaping students' situational engagement. The factors examined in the present thesis were chosen based on previous literature and on an interest in the factors relevant for practical implications. However, other researchers may have chosen somewhat different factors as their starting point. Future studies are needed to broaden the scope with respect to the different factors related to situational engagement. One particularly interesting line of research would be to examine teachers' situational work engagement and how it may both be affected by and affect to students' situational engagement in the same lessons (see the theoretical proposition of this kind of cyclic process, for example, in Connell & Wellborn, 1991).

In addition, with respect to findings on the associations between overall and situational engagement, it should be noted that due to the study design, these associations were examined by identifying students with specific patterns in overall engagement (LPA), and then examining the differences in situational engagement between the identified subgroups. While this provided a unique empirical view of the associations between overall and situational engagement, by being the cross-sectional and not longitudinal, the design did not allow predictive analyses. Previous literature has offered the theoretical suggestions that overall and situational engagement may form a cyclic process, whereby students' situational experiences of engagement may lead to outcomes that reinforce their overall engagement, which in turn is associated with students' situational engagement (see Lawson & Lawson, 2013). A longitudinal research design with repeated assessments of both levels of student engagement over an extended time frame, in which encounters of learning tasks, environments, relationships, and feedback received are observed, is needed to enhance the understanding of this proposed cyclical nature of students' engagement formation. This kind of data can provide important novel insights when analyzed with even more fine-grained intra-individual multilevel structural equation models such as time series modelling (see Schmitz, 2006; Malmberg, 2020).

Along with the limitations drawn from the chosen research methods and used data, it should also be noted that the field of student engagement is still riddled with some ambiguities regarding researchers' use of the key construct. To address this problem, researchers are required to clearly and precisely enunciate the definition of engagement they are committed to, and how they see en-

gement in relation to the near constructs such as motivation. Based on the relevance of understanding students' commitment to and participation with school, it was considered important to examine how student engagement is tied with the contexts. In the present thesis, the tripartite approach (see Fredricks et al., 2004) and self-system process model (see Connell & Wellborn, 1991) were seen to provide well-suited bases. However, ideally the field of student engagement should achieve greater clarity with regard to the boundaries of the construct and should take a clearer stance with respect to the field of motivation and its numerous constructs. For the field of student engagement to take a step forward these issues concerning the key construct will need to be actively acknowledged and addressed.

Finally, as regards the future directions in the field of student engagement, future studies are needed to increase the understanding of the different facilitating factors of situational engagement. Particularly important is the development of informed ways in which the situational engagement of students with low or somewhat moderate overall engagement and that of boys can be promoted. The future studies should also more vigorously examine the role that teachers play in shaping their students' situational engagement. Combining information on situational engagement of both the teachers and their students' would be interesting. Finally, the future studies should move beyond the use of cross-lagged designs and examine students' situational and overall engagement in ways that could increase the understanding of how these two evolve transactionally over time.

7 CONCLUSIONS

The present thesis was designed to contribute to the field of student engagement by increasing the understanding of situational engagement, which is still a relatively little-examined area within the much larger research field. First, the findings corroborated the unique importance of examining student engagement at the situational level. This kind of research is needed to produce novel information on the situational fluctuations present in students' engagement. Second, the findings revealed significant and meaningful associations between students' situational engagement and their characteristics and contextual factors. Such knowledge can provide both researchers and practitioners with tools to recognize students who need learning support and to create a basis for making informed recommendations and guidelines for such support. Third, the thesis provided empirical evidence indicating that overall and situational engagement are associated, but students are not identical with respect to concordance in levels of engagement. This finding enhances the understanding on the different types of factors impacting students' situational engagement.

The findings of the thesis lead to the conclusion that there is intra-individual variation in student engagement, and this should be acknowledged both in the research field and in the school setting. While the findings revealed that students' situational engagement is associated with student characteristics, the thesis also highlighted the role of teacher-student interaction in students' fluctuating engagement. Such findings serve as an important reminder that students in lower secondary school benefit from a high provision of emotional support and classroom organization in their learning environments in the course of all their lessons throughout the school days.

YHTEENVETO

Tässä tutkimuksessa tarkasteltiin yläkouluikäisten oppilaiden kouluun kiinnittymistä sekä siinä ilmenevää tilannesidonnaista vaihtelua oppitunneilla. Kiinnittyminen (engl. student engagement) on tässä tutkimuksessa määritelty aiempaan kirjallisuuteen nojaten moniulotteiseksi käsitteeksi, jolla kuvataan oppilaan toiminnallista, tunneperäistä sekä kognitiivista kouluun ja oppimiseen kiinnittymistä (Fredricks ym., 2004; Wang ym., 2011). Näistä toiminnallinen kiinnittyminen kuvaa sitä, missä määrin oppilaat osallistuvat oppimista edistävään toimintaan sekä noudattavat koulun normeja ja toimintakäytänteitä. Tunneperäinen kiinnittyminen kohdistuu puolestaan oppilaan koulua ja oppimista koskeviin tunteisiin sekä osallisuuden ja saadun tuen kokemuksiin. Kognitiivinen kiinnittyminen heijastaa sellaista oppilaan kognitiivista panostusta ja itsesäätelyä, joka tukee haasteisiin tarttumista ja aktiivista oppimista.

Tämän tutkimuksen keskeisenä lähtökohtana on ollut näkemys siitä, että kiinnittymisen tarkastelu voi kohdentua kahdelle eri tasolle. Näistä ensimmäinen, *oppilaan yleinen kiinnittyminen*, keskittyy oppilaan keskimääräiseen kiinnittymiseen. Tällä tasolla kohdistetaan huomio kullekin oppilaalle tyypilliseen yli ajankohtien ilmenevään yleiseen kiinnittymisen kokemukseen. Vaikka yleinen kiinnittyminen nähdään muovautuvaksi pikemmin kuin pysyväksi ominaisuudeksi (Fredricks ym., 2004), yleisen kiinnittymisen tasolla tapahtuvassa tarkastelussa huomio ei kohdennu siihen, missä määrin kiinnittyminen vaihtelee oppimistilanteesta toiseen, vaan millaista se on keskimäärin. Kiinnittymistä on kuitenkin tärkeää tarkastella myös sen toiselta tasolta eli *oppilaan tilannesidonnaisesta kiinnittymisestä* käsin. Tilannesidonnaisten kiinnittymisen tarkastelu korostaa sitä, että oppilaiden kiinnittyminen vaihtelee oppitunnista, oppimistilanteesta ja hetkestä toiseen. Tilannesidonnaisten kiinnittymisen arviointi edellyttää oppilailta pyydettyjä välittömiä arvioita siitä, millaista hänen kiinnittymisensä on ollut juuri kuluneen oppimistilanteen, kuten oppitunnin aikana. Tilannesidonnaista kiinnittymistä ja sen vaihtelua on tarkasteltu vielä verrattain vähän.

Väitöstutkimuksen tavoitteena oli lisätä teoreettista, menetelmällistä, empiiristä ja käytännöllistä tietoa siitä, missä määrin oppilaiden tilannesidonnaisten kiinnittyminen vaihtelee ja mitkä oppilaaseen ja oppimisympäristöön liittyvät tekijät ovat yhteydessä tähän vaihteluun. Lisäksi kiinnostuksen kohteena oli, kuinka oppilaan yleinen kiinnittyminen ja tilannesidonnaisten kiinnittyminen ovat yhteydessä toisiinsa. Tutkimus koostui kolmesta Alkuportaatt-seurantatutkimuksen aineistoon perustuvasta osatutkimuksesta. Osallistujina oli perusopetuksen seitsemännen vuosiluokan oppilaita, joita oli osana seurantatutkimusta pyydetty arvioimaan kouluun kiinnittymistään sekä yleisen kiinnittymisen että oppituntikohtaisen tilannesidonnaisten kiinnittymisen tasolla.

Ensimmäisessä osatutkimuksessa tarkasteltiin oppilaiden tilannesidonnaista kiinnittymistä sekä sen yhteyttä yläkoulun tuntien oppiaineisiin ja oppitunnin aikaan. Tutkimuksessa hyödynnettiin aineistoa, jossa oli pyydetty 57:ltä seitsemännen luokan oppilaalta arvioita tilannesidonnaisesta kiinnittymisestään

InSituations (InSitu; Lerkkanen ym. 2012) mittaria hyödyntäen yhden kalenteriviikon ajan toistuvasti lähes jokaisen oppitunnin päätteeksi. Kaikkiaan 1 328 tilannesidonnaisen kiinnittymisen arviota sisältävä aineisto analysoitiin monitasomallinnuksen keinoin. Tulokset osoittivat aiemman tutkimuksen tavoin, että oppilaiden kiinnittyminen vaihtelee oppitunnista toiseen. Lisäksi tulosten mukaan oppilaiden tilannesidonnainen kiinnittyminen oli yhteydessä oppiaineeseen: oppilaiden arvioinnit osoittivat korkeampaa tilannesidonnaista kiinnittymistä eiakateemisten oppiaineiden tunneilla kuin akateemisten oppiaineiden tunneilla.

Toinen osatutkimus tarkasteli opettajan ja oppilaiden välisen vuorovaikutuksen laadun yhteyttä oppilaiden tilannesidonnaisen kiinnittymiseen. Aineisto sisälsi 155 videoitua äidinkielen ja kirjallisuuden sekä matematiikan oppituntia (51 aineenopettajan opettamana), jotka arvioitiin käyttäen strukturoitua havainnointimenetelmää Classroom Assessment Scoring System - Secondary (CLASS-S; Pianta ym. 2012). Menetelmällä selvitettiin oppituntien opetusvuorovaikutuksen laatua tunnetuen, toiminnan organisoinnin sekä ohjauksellisen tuen osa-alueilla. Tämän lisäksi aineistona oli videoiduilta oppitunneilta InSitu-mittarilla kerätyt oppilaiden arviot tilannesidonnaisesta kiinnittymisestään (yhteensä 1 647 tilannesidonnaista arviota 709 oppilaalta). Aineisto analysoitiin monitasomallinnusta hyödyntäen. Tulokset osoittivat, että opetusvuorovaikutuksessa ilmenevä tunnetuki oli myönteisesti yhteydessä oppilaiden tilannesidonnaiseen tunneperäiseen kiinnittymiseen ja toiminnan organisointi puolestaan oli yhteydessä toiminnalliseen ja kognitiiviseen kiinnittymiseen. Tämän lisäksi tutkimuksessa havaittiin yhdysvaikutus opetusvuorovaikutuksessa ilmenevään tunnetukeen ja sukupuoleen liittyen. Tyttöjen tilannesidonnainen kiinnittyminen oli vahvemmin yhteydessä oppitunneilla ilmenevään tunnetukeen kuin poikien.

Kolmannessa osatutkimuksessa käytettiin henkilösuuntautunutta alaryhmäanalyysiä. Siinä tunnistettiin oppilaiden yleisen kiinnittymisen perusteella muodostettuja profiileja sekä tarkasteltiin sitä, kuinka muodostuneet alaryhmät erosivat toisistaan oppilaiden taustamuuttujien, akateemisen taitotason sekä tilannesidonnaisen kiinnittymisen suhteen. 301:n oppilaan arviot yleisestä toiminnallisesta, tunneperäisestä ja kognitiivisesta kiinnittymisestään analysoitiin latentin profiilianalyysin keinoin. Analyysin perusteella voitiin erottaa neljä alaryhmää: 1) oppilaat, joiden yleinen kiinnittyminen oli korkeaa (29.5 %), 2) oppilaat, joiden yleinen kiinnittyminen oli verrattain matalaa (4.7 %), 3) oppilaat, joiden yleinen kiinnittyminen oli keskimääräistä (37.9 %) sekä 4) oppilaat, joiden yleinen kiinnittyminen oli muutoin keskimääräistä, mutta heiden tulevaisuuden tavoitteensa olivat korkeita (27.9 %). Kaikki oppilaat arvioivat yleisen kiinnittymisen lisäksi tilannesidonnaista kiinnittymistään vähintään kolmen oppitunnin päätteeksi. Monitasomallinnuksen avulla tarkasteltiin tilannesidonnaista kiinnittymistä eri ryhmissä. Tulokset osoittivat, että oppilaiden yleinen kiinnittyminen ja tilannesidonnainen kiinnittyminen olivat yhteydessä joiltakin osin, mutta yhteyksiä osoittavat ryhmien erot eivät olleet systemaattisia. Tulokset osoittivat esimerkiksi, että alaryhmien 1 ja 4 oppilailla oli vähemmän vaihtelua tilannesidonnaisessa kiinnittymisessään kuin kahden muun ryhmän oppilailla.

Kaiken kaikkiaan väitöstutkimus tuotti kolme keskeistä päätulosta. Ensinnäkin havaittiin aiemman kirjallisuuden löydöksiä vahvistaen, että kiinnittyminen vaihtelee oppitunnista toiseen. Tämä tulos on merkityksellinen ja vahvistanee kiinnostusta tilannesidonnaisen kiinnittymisen tutkimiseen. Toiseksi tulokset osoittivat, että oppilaaseen itseensä ja oppimisympäristöön liittyvät tekijät ovat yhteydessä oppilaan tilannesidonnaisen kiinnittymisen muodostumiseen. Erityisen keskeiseksi voi nähdä toisen osatutkimuksen tulokset, jotka osoittivat opettajan ja oppilaan välisellä opetusvuorovaikutuksella olevan merkitystä oppilaiden tilannesidonnaiselle kiinnittymiselle. Kolmanneksi tulokset antoivat aiempaan kirjallisuuteen nähden uusia merkittäviä havaintoja siitä, miten oppilaan tilannesidonnainen ja yleinen kiinnittyminen ovat yhteydessä toisiinsa. Näiden lisäksi tulokset vahvistivat sitä, että uuden tiedon saavuttaminen edellyttää monipuolisten, monitasoista mallinnusta hyödyntävien tutkimusmenetelmien käyttöä.

Tutkimuksen tulokset ovat merkittäviä myös käytännön kannalta. Tulokset osoittivat, että keskimäärin pojat tarvitsevat tyttöjä enemmän tukea tilannesidonnaiseen kiinnittymiseen. Lisäksi havaittiin, että yleisellä tasolla kohtalaisen matalaa kiinnittymistä raportoivien oppilaiden ohella myös ne oppilaat, joiden yleinen kiinnittyminen oli keskimääräistä, tarvitsevat tukea tilannesidonnaiseen kiinnittymiseensä. Tulosten mukaan yläkoulun opettajat voivat edistää oppilaiden tilannesidonnaista kiinnittymistä opetusvuorovaikutuksessa ilmenevän myönteisen tunnetuen ja toiminnan organisoinnin avulla.

Tulevaisuudessa tilannesidonnaiseen kiinnittymiseen keskittyvää tutkimusta tarvitaan enenevässä määrin. Väitöstutkimuksessa tarkasteltiin vain pientä osaa niistä tekijöistä, jotka voivat mahdollisesti olla yhteydessä oppilaiden tilannesidonnaiseen kiinnittymiseen. Erityisen mielenkiintoista olisi tarkastella sitä, kuinka opettajan kokema tilannesidonnainen työhön kiinnittyminen olisi yhteydessä oppilaiden tilannesidonnaisiin kiinnittymisen kokemuksiin. Tärkeää olisi myös kohdentaa huomiota siihen, kuinka tilannesidonnainen ja yleinen kiinnittyminen toisiinsa kytkeytyvän vastavuoroisen prosessin myötä vaikuttavat toisiinsa ja rakentavat oppilaan kiinnittymistä.

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ORIGINAL PAPERS

I

VARIATION IN SITUATION-SPECIFIC ENGAGEMENT AMONG LOWER SECONDARY SCHOOL STUDENTS

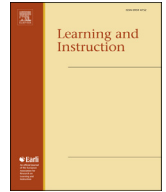
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Variation in situation-specific engagement among lower secondary school students



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ABSTRACT

The majority of previous research has examined school engagement as an overall student characteristic. The present study contributes to the field by examining variation in students' situation-specific engagement from one lesson to another and by investigating situational determinants of such variation. An intensive one-week lesson-to-lesson data collection was conducted in four lower secondary school classrooms. Students rated their situation-specific engagement at the end of each lesson with a mobile-based InSitu instrument. Data comprising a total of 57 students and 1328 ratings were analyzed with two-level hierarchical multivariate model (between students, and within students between lessons). The results indicated substantial within student variation in engagement between lessons which was predicted by school subjects. Students reported highest situational engagement and lowest disaffection in lessons of non-academic subjects. The findings extend prior literature by specifying factors affecting students' situation-specific engagement and by unraveling effects due to variation within and between students.

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1. Introduction

A considerable body of literature indicates that engagement plays a significant role in students' academic learning (e.g., Appleton, Christenson, Kim, & Reschly, 2006; Fredricks, Blumenfeld, & Paris, 2004; Skinner, Kindermann, & Furrer, 2009). Engagement predicts attendance and academic resilience, whereas lack of school engagement leads to negative consequences, such as underachievement and school drop-out (Fredricks et al., 2004). During secondary school years in early adolescence, risks for development of disengagement (Roeser, Eccles, & Sameroff, 2000) and alienation from school (Skinner & Pitzer, 2012) are particularly pronounced. The existing research on student engagement is dominated by a focus on trait-like indicators of students' general school engagement. The assessment of situation-specific classroom engagement is much more infrequent despite the widely

acknowledged view of engagement as malleable and sensitive to various changing factors in the environment (Fredricks et al., 2004). Thus, only little is known about the variation in student engagement over short time periods during the school week (Eccles & Wang, 2012). Analysis of engagement in lesson-to-lesson learning experiences has been called for to gain deeper understanding of the dynamics and the key factors within the classroom that foster or impede engagement and learning motivation (Appleton et al., 2006; Finn & Zimmer, 2012). Consequently, the purpose of the present study was to examine variation in students' situation-specific engagement during a school week by collecting lesson-to-lesson ratings and paying attention to both the subject being studied and time of a day.

1.1. Student engagement

Engagement has been described as students' involvement and commitment with school in ways that promote their learning (Fredricks et al., 2004; Skinner et al., 2009; Wang, Willett, & Eccles, 2011). In the tripartite approach to engagement, *behavioral engagement* refers to students' participation and involvement with learning and academic tasks, students' positive conduct, and

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participation in extra-curricular school-related activities (Fredricks et al., 2004; Skinner et al., 2009). *Cognitive engagement*, in turn, captures students' cognitive investment in learning (Archambault, Janosz, Fallu, & Pagani, 2009; Fredricks et al., 2004) including valuing of school and academic attainment (Connell & Wellborn, 1991), orientation towards mastery of knowledge and skills (Newmann, Wehlage, & Lamborn, 1992), and use of metacognitive strategies (Zimmerman, 1990). Finally, *emotional* (or affective) *engagement* comprises students' sentiments toward school and learning and their sense of belonging with other students, teachers and school (e.g., Finn, 1989; Fredricks et al., 2004; Skinner et al., 2009).

Parallels can be found between different components of engagement, and the concepts capturing aspects of students' learning motivation (see e.g., Fredricks et al., 2004; Skinner et al., 2009). These concepts include for example, task-focused behavior (Onatsu-Arvilommi & Nurmi, 2000) and flow (Csikszentmihalyi, 1990) aligning with behavioral engagement, i.e., persistence, attention and participation in academic behaviors. Concepts such as intrinsic motivation (Deci & Ryan, 1985; Larson & Rusk, 2011; Ryan & Deci, 2000), mastery-goal orientation (Dweck, 1986), task-value (Eccles et al., 1983), and self-regulation (Wolters & Taylor, 2012) and self-regulated learning (e.g., Boekaerts, Pintrich, & Zeidner, 2000) are similar or overlapping concepts with cognitive engagement construed as preference for and investment in challenging academic learning. Finally, anticipatory and achievement emotions (Pekrun, 2009) share similarities with the concept of emotional engagement. The particular value of the multifaceted construct of engagement lies in the comprehensive nature through which it captures students' actual behaviors, thinking, and feelings in learning situations and in the school context (e.g., Skinner, 2016). Thus, engagement is crucially involved with the entity of learning at school, and can optimally capture its multiple antecedents and consequences simultaneously and dynamically (see Fredricks et al., 2004), and inform on ways of supporting students' learning.

The conceptualization of student engagement contains the presumption that engagement is malleable, thus, responsive to variations within learning contexts and situations (e.g., Appleton, Christenson, & Furlong, 2008; Fredricks & McColskey, 2012; Fredricks et al., 2004). The studies in the field, however, have mostly been based on measuring students' engagement as a trait-like construct at single points of time and by aggregating information from different situations (Eccles & Wang, 2012; Fredricks et al., 2004). Although these studies have provided valuable insights into the overall nature of engagement, they do not provide understanding of variation of engagement in different learning settings, tasks, and conditions (Fredricks & McColskey, 2012). In order to understand how the characteristics of learning situations at school impact student engagement and how it can be supported in authentic learning situations, studies focusing on situational variation of student engagement are needed.

1.2. Situational engagement

The existing literature suggests that students' engagement is formed in transaction with the context in which they study and learn (Eccles & Wang, 2012). Thus, engagement should not solely be examined as a general tendency or an individual characteristic, but as a constantly fluctuating state sensitive to situational factors (Appleton et al., 2008; Fredricks et al., 2004; Skinner et al., 2009). Thus far, only a limited number of studies have investigated situational variation in student engagement. In a recent study by Martin et al. (2015), secondary school students were asked to complete a short form of the Motivation and Engagement Scale three times in the school day (before lunch, before the last lesson,

and during evening homework) over a four-week period. The results showed significant intra-individual variation (23% of the total variation) in students' motivation and engagement between different measurement points. We documented in our previous study (Vasalampi et al., 2016) that although inter-individual variation in situational engagement of lower secondary school students' was significantly associated with their overall engagement, there was also substantial intra-individual variation (50% of the total) in engagement between lessons. Unfortunately, these studies did not provide information on situational factors contributing to this variation.

Skinner et al. (2009) have suggested that interaction between students and various situational factors, i.e., school subjects, assignments, and time, is likely to have an impact on students' experiences and their engagement in the classroom (see also, Eccles & Wang, 2012; Fredricks et al., 2004). For example, feedback that students receive of their success in managing learning tasks in a particular subject, such as mathematics, has consequences for their self-concept, interest and engagement in that subject (cf. Eccles et al., 1983). However, empirical evidence on contribution of situational factors to engagement is scarce. As an exception, Shernoff, Csikszentmihalyi, Schneider, and Shernoff (2003) studied situational engagement by utilizing an experience sampling method to ask students to rate their experiences of concentration, interest, and enjoyment on a given moment. They found that students reported higher engagement in lessons of non-academic subjects, including arts and computer science, than in academic subjects, such as math and history. These findings are, however, limited in breadth of measures as only one item was used to assess each dimension.

Although some studies have proposed, that time has an impact on situational engagement (Appleton et al., 2006; Skinner et al., 2009), empirical evidence tapping this issue is still limited. There are some studies showing, for example, that students achieve higher scores from lessons scheduled for late morning compared to other times of day (Cortes, Bricker, & Rohlf, 2009; Klein, 2007), and that students report the lowest positive affect as well as the highest negative affect, and highest experience of challenges on Mondays (Tolvanen et al., 2011). The recent study by Martin et al. (2015), however, did not find any time-related variation in situational engagement. Thus, while the findings in the literature are somewhat inconsistent they suggest that also time of the lesson is a factor which needs to be taken into consideration in studies of situational engagement.

1.3. Engagement in relation to students' characteristics

Prior literature has shown that students' engagement may be shaped by students' characteristics such as gender and achievement level (e.g., Skinner et al., 2009; Wang & Decol, 2014). Higher behavioral, emotional, and cognitive engagement with school and learning has repeatedly been documented for girls than for boys (Lam et al., 2012a; Lam et al., 2016; Marks, 2000). In light of previous literature, this gender difference could be due to higher persistence of girls when facing challenges (Martin, 2004), their higher willingness to adapt to school norms and set mastery goals (Eccles & Roeser, 2011; Martin, 2004), their higher sense of relatedness (Furrer & Skinner, 2003), and attitudes making it more socially acceptable for secondary school girls to work hard in school (Warrington, Younger, & Williams, 2000) as compared to boys.

Level of student engagement has also been documented to be associated with students' academic achievement and motivation (see Fredricks et al., 2004). Academically successful middle and high school students have been found to report greater engagement with school than students with low academic success

(Virtanen, Lerkkanen, Poikkeus, & Kuorelahti, 2014; Wang & Fredricks, 2014). This finding is similar to those showing that academic achievement predicts subsequent task-focused behavior (Onatsu-Arvilommi & Nurmi, 2000) and interest in academic subjects (e.g., Viljaranta, Tolvanen, Aunola, & Nurmi, 2014). Taken together, the prior evidence, thus, suggests that successful learning experiences and academic achievement are important for evolving engagement.

1.4. The present study

The present study investigated situational variation in student engagement by using lesson-to-lesson ratings from an intensive one-week data collection among 7th graders. The aim was to determine the extent to which student engagement varies between students and within students between lessons. Variation in engagement between students was predicted by students' academic achievement (Wang & Fredricks, 2014), whereas the variation between lessons was predicted by school subject (Marks, 2000; Shernoff et al., 2003) and time of the lesson within the school day (Csikszentmihalyi & Hunter, 2003). Based on prior literature, we controlled for gender (Lam et al., 2012a) and day of the week (Tolvanen et al., 2011). We expected to find between-student (inter-individual) variation in students' engagement (Martin et al., 2015; Vasalampi et al., 2016), as well as within student (intra-individual) variation between lessons (i.e., from one lesson to another). We assumed that students' high engagement would be associated with high academic achievement (Virtanen et al., 2014). In turn, lesson-to-lesson variation was expected to be associated with school subject being studied (Marks, 2000; Shernoff et al., 2003) and time of the day (Csikszentmihalyi & Hunter, 2003).

2. Method

2.1. Participants and procedure

The present study was part of an extensive longitudinal age cohort study (First Steps study; Lerkkanen et al., 2006–2017), comprising 1879 students, along with their parents and teachers, which investigates children's academic and motivational development from the pre-primary to the ninth grade, and the effects of school and home environments on child outcomes. The sample for the larger longitudinal study was recruited from four municipalities in Finland: two in Central, one in Western, and one in Eastern Finland. The guardians gave their written consent for their children's participation in the study.

2.1.1. The sample of present study

The sample of the present study, participants of a one-week intensive lesson-to-lesson follow-up from Grade 7, comprised 57 students (24 girls and 33 boys). The students invited to participate to this study came from four classes from two lower secondary schools (School 1: three classes; School 2: one class). School 1 was a medium-sized school with a student body of approximately 400 located in Central Finland. School 2 was a school of similar size located in Western Finland. From School 1, the participants comprised a total of 46 students from three classes (Class A: 15 participants out of 18 students; Class B: 15 participants out of 16 students; Class C: 16 participants out of 19 students), and from School 2, a total of 11 out of 24 students from one class (Class D). The percentage of students with parental consent for participation in the assessments of the longitudinal age cohort study was on average 74.0% in the four classes. All students with parental consent from the four classes participated in the ratings of situational

engagement during one-week intensive data collection. The students' average age was 13.12 years ($SD = 0.26$) at the beginning of Grade 7. The participants attended general education in mainstream schools and all students were Finnish-speaking.

Classes that provided data for the present study were selected from the longitudinal follow-up based on two criteria. Priority was given to classes in which: (1) a high percentage of the students were participants of the longitudinal follow-up; and (2) a high percentage of the subject teachers teaching this class were willing to enable the intensive data collection. The subsample of the present study was highly representative of the participants of the longitudinal study with respect to general engagement assessed using a Finnish short version (Virtanen et al., 2014) of the Student Engagement Instrument (SEI, Appleton et al., 2006). In four out of five factors of the SEI (control and relevance of school work, teacher-student relationship, future aspirations and goals, and peer support in learning), no statistical differences were found between the larger sample and the subsample of this study. The only difference between the present subsample and the main sample emerged for students' experience of family support in learning, where students in the present subsample gave lower ratings ($t(1731) = -2.45, p < 0.05$). With respect to mothers' educational level, the subsample was representative of the main sample of the longitudinal study. In the present subsample, a total of 7.3% of the mothers had a low educational level, 73.2% had a medium educational level, and 19.5% had a high educational level. Furthermore, no statistical differences were found in the teachers' educational levels or work experience between those teachers who participated in the present data collection ($N = 34$) and other teachers ($N = 252$) involved in the longitudinal study.

Each attending class participated in an intensive one-week follow-up in spring 2014. In School 1, the students were asked to rate their situation-specific engagement at the end of each of the 30 lessons of the week. In School 2, some of the teachers did not agree to allow student ratings of situational engagement in their lessons; thus, students were requested to rate a maximum of 23 lessons.

Student ratings of situational engagement were carried out using a mobile application which was pre-programmed into smart phones. The phones were handed out simultaneously to the students at the end of the lessons and collected from them a few minutes later, once they had completed a short questionnaire (see a similar procedure by Malmberg & Hagger, 2009). The ratings available for each student varied depending on the students' attendance at school during that week. In Class A, the students rated their situation-specific experiences an average of 24.1 times ($SD = 3.1$, range 17–28); in Class B, an average of 25.9 times ($SD = 4.26$, range 19–30); in Class C, an average of 24.0 times ($SD = 6.7$, range 8–30); and in Class D, an average of 17.7 times ($SD = 5.2$, range 5–23). With a total response rate of 81.8%, the data for the present study contained a total of 1328 time-stamped ratings of students' situation-specific experiences.

2.1.2. Education in Finland

In Finland, the nine-year compulsory comprehensive education begins in the year when the child turns 7 years of age. During lower secondary school (Grades 7, 8, and 9), students are taught by subject teachers who have master's degrees in the subject they teach and have completed pedagogical studies. The vast majority of schools are free-of-charge public schools which follow the national core curriculum, and most often students attend school nearest to their home (OECD, 2012).

At the beginning of the seventh grade, students are assigned into home groups (i.e., classes), with 17 students, on average, in each group. Most of the time, the same set of students study together and move from the classroom of one subject teacher to

another, according to their daily timetables. However, in some cases, classes are divided into different and/or slightly smaller groups, especially for subjects that include practical work, such as physics, chemistry, and home economics.

In lower secondary school, students have approximately 30 lessons per week. School days begin between 8 a.m. and 10 a.m. and end between 2 p.m. and 4 p.m. Days comprise up to seven lessons, and each lesson is followed by a short recess. The most typical length of a lesson is 45 min, but it is possible to have 75- or 90-min lessons as well, after which there is a 15-min break. Times of the day when different subjects are taught for each class are not standard but vary randomly; math lessons can be the first one in the morning on some days and the last in the afternoon on some other day of the week.

2.2. Measures

2.2.1. Situation-specific engagement

Students' self-rated situation-specific engagement was measured at the end of the lessons using the mobile-based InSituations (InSitu) instrument (Lerikkanen, Vasalampi, & Nurmi, 2012; Vasalampi et al., 2016) developed within the longitudinal First Steps study (Lerikkanen et al., 2006–2017). Items comprising the InSitu instrument were based on earlier studies and measures concerning students' situational engagement and motivation (e.g., Malmberg & Hagger, 2009; Martin et al., 2015; Reeve, 2013; Skinner et al., 2009) and adapted for the current context. InSitu consists of 17 items (Table 1) rated on a 5-point scale (1 = not at all; 5 = very much). The measure has been piloted prior to this study.

The psychometric structure of the InSitu instrument was established using confirmatory factor analysis (CFA). As InSitu is a relatively new measure, the factor analyses were conducted with two different sets of data, first with the present intensive one-week lesson-to-lesson data (collected in classes A, B, C, and D; $N = 57$;

1328 time-stamped ratings), and, second with the larger set of data ($N = 3457$ time-stamped ratings) of the longitudinal age cohort study. This larger set of data was collected in spring 2014 as part of the longitudinal First Steps study (a total of 288 lessons from a total of 30 schools) by asking Grade 7 students ($N = 884$) to rate their situation-specific experiences at the end of two to four video-recorded lessons (for more details, see Vasalampi et al., 2016).

CFA analyses indicated a five-factor structure for the InSitu: 1) behavioral and cognitive engagement (7 items, $\alpha = 0.83$); 2) emotional engagement (3 items, $\alpha = 0.85$); 3) disaffection (3 items, $\alpha = 0.68$); 4) competence experiences (2 items, $\alpha = 0.81$); and 5) help-seeking (2 items, $\alpha = 0.76$). The model fit for the five-factor CFA was acceptable: $\chi^2(109) = 1390.90$, $p < 0.001$; CFI = 0.932; RMSEA = 0.058; SRMR = 0.051. In line with the tripartite approach to engagement (e.g., Fredricks et al., 2004) consisting of behavioral, cognitive and emotional components of engagement only the first three latent factors of the InSitu instrument were used in the current study, and the two remaining factors (situational competence experiences, and help-seeking) were excluded from the present analyses. The first latent factor termed as *behavioral and cognitive engagement* (items presented in Table 1) was originally intended to measure behavioral and cognitive engagement as two separate factors, but the results of the factor analysis strongly suggested that the items comprise one latent factor. From a theoretical perspective, this was unfortunate but not unprecedented, as aspects such as effort has been viewed as an indicator of behavioral as well as cognitive engagement (Fredricks et al., 2004). The second latent factor, *emotional engagement*, assesses the students' positive feelings in the lesson (Table 1). The third latent factor assesses *disaffection* in line with the conceptualization by Skinner et al. (2009) where engagement is manifested through behaviors and emotions that reflect maladaptive motivational states such as lack of attention, enthusiasm and positive affect (Table 1). The factor loadings from the larger set of data, a total of 3457 ratings were used to calculate the factor scores (sum scores) for the analyses of the present study.

2.2.2. Situational variables

The *subject being studied* refers to the school subjects of the lessons from which mobile ratings were collected. Mobile ratings were available for the following 15 subjects: mother tongue and literature (i.e., Finnish as the mother tongue), mathematics, English, Swedish, biology, geography, physics, history, health education, religion, home economics, visual arts, music, physical education, and crafts. However, ratings from religion, music, and geography were later excluded because ratings for these subjects were only available from one subject teacher for each of these subjects.

When conducting statistical analyses, some of the subjects were merged to form larger units of subject areas. The following subjects and subject areas were used in the analyses: mother tongue and literature (Finnish), mathematics, English, Swedish (which is the second national language in Finland), science (physics and biology combined), humanities (history and health education combined), home economics, arts and crafts (visual arts and crafts combined), and physical education. This categorization into larger units of subjects for the analyses was based on combining subjects that share similarities, for instance, with respect to disciplinary orientation (e.g., physics and biology as experimental sciences) or instructional practices (e.g., history and health education as subjects utilizing inquiry learning and group work). In the case of the two languages, English and Swedish, a decision was made to analyze the subjects separately, because these languages have a different status in Finland (Swedish is the other official language). Some of the subjects (i.e., Finnish as mother tongue, mathematics, home economics and physical education) were seen to represent

Table 1
Items of the InSitu instrument.

1. Behavioral and cognitive engagement (7 items)
Beh/Cogn 1. How important did you find the studied contents?
Beh/Cogn 2. How much did you try to act according to the teacher's wishes?
Beh/Cogn 3. How much did you invest effort into making the teacher pleased with you?
Beh/Cogn 4. To which extent were you prepared for the lesson?
Beh/Cogn 5. How well did you concentrate during the lesson?
Beh/Cogn 6. How persistent were you in studying during the lesson?
Beh/Cogn 7. How much did you plan your tasks ahead instead just doing them right away?
2. Emotional engagement (3 items)
Emo 1. How much did you like this lesson?
Emo 2. How pleasing did you find the studied tasks?
Emo 3. How enjoyable was the lesson?
3. Disaffection (3 items)
Daff 1. How much did you do other things than the ongoing tasks and instruction?
Daff 2. How tired did you feel during the lesson?
Daff 3. How boring was the lesson?
4. Competence experiences (2 items)*
Comp 1. How easy was the lesson for you?
Comp 2. How well did you understand what was taught?
5. Help-seeking (2 items)*
Help 1. How much did you ask for help from the teacher/another adult during the lesson?
Help 2. How much did you ask for help from your classmates during the lesson?

Note. Rated using a 5-point scale: 1 = not at all to 5 = very much. * not included in current analyses.

unique content areas (cf., Finnish National Board of Education, 2016) and combining these into larger units was not considered relevant.

The day of the week consisted of a nominal 5-point scale (1 = Monday; 5 = Friday). The time of day (collected routinely as part of the mobile application of InSitu ratings) was grouped into the following three categories: 8 a.m.–10 a.m., 10 a.m.–1 p.m., and 1 p.m.–3:30 p.m.

2.2.3. Individual student factors

Variables representing students' individual factors consisted of gender (1 = girl; 2 = boy) and level of academic achievement. The measure of academic achievement was based on the grade point average derived from the school registers of the students' school year report from Grade 7.

2.3. Analytical strategy

Because the data were hierarchical in nature (lessons nested within students), two-level hierarchical multivariate model between students ($N = 57$), and within students between lessons ($N = 1328$ ratings) was generated with the latent factors of engagement (i.e., behavioral/cognitive engagement, emotional engagement and disaffection) as dependent variables. Variation between days were analyzed as fixed effects entering days as dummy variables to the multivariate model (i.e., the effects were controlled for).

Several predictors were also entered into the multivariate model. At the between-students level, we tested the extent to which students' academic achievement predicted variation in engagement (i.e., behavioral/cognitive engagement, emotional engagement and disaffection) when student gender was controlled for. At the within-students between-lessons level, we used two procedures to test the effects of the subject being studied and the time of day (both dummy-coded) on engagement (behavioral/cognitive engagement, emotional engagement, and disaffection). First, by utilizing two-level hierarchical modeling with MLR estimator we calculated beta values for each dummy-coded school subject and the time of the day, as well as the total percentage of explained variance of school subjects at within level. Second, we conducted paired comparisons between school subjects. The possible effects of individual teachers were controlled at the within-student level by using teacher ID as a clustering variable.

Analyses were conducted with the robust maximum likelihood (MLR) as estimator using the Mplus statistical package (version 7.3; Muthén & Muthén, 1998–2012). Because some students were absent from a lesson or a full day, the data included some missing observations. The Mplus statistical package is able to correct distortions caused by incomplete data given that missingness is random (Hox, 2010). Since Little's MCAR test suggested that missingness was completely random ($\chi^2(57) = 47.668$, $p = 0.806$), the standard missing at random (MAR) approach was applied. Consequently, the parameters of the models were estimated using full information maximum likelihood (FIML) estimation.

3. Results

3.1. Correlations and intra-class correlations for situation-specific engagement

As a preliminary stage of the analyses, we investigated variation in students' behavioral/cognitive engagement, emotional engagement, and disaffection between students, between days within week, and between lessons within day by using intra-class correlations (ICC). As presented in Table 2, high intra-class correlations

Table 2

Intra-class correlations within the day, between the days, and between the individuals.

	Behavioral and cognitive engagement	Emotional engagement	Disaffection
ICCwithin _{day}	0.634 ***	0.706 ***	0.531 ***
ICCbetween _{days}	0.072 *	0.075 **	0.077 **
ICCbetween _{individuals}	0.294 ***	0.219 ***	0.392 ***

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

were found for between lessons, moderate for between students, and small for between days within week. Thus, these results showed that students' behavioral/cognitive engagement, emotional engagement, and disaffection varied most strongly between lessons and somewhat between students.

Correlations between the three latent factors of situational engagement (i.e., dependent variables) were also calculated (Table 3). Behavioral/cognitive engagement and emotional engagement were strongly associated at the between-students level and moderately associated at the within-students between-lessons level. Disaffection had low correlations with behavioral/cognitive engagement and none with emotional engagement at both levels. Interestingly, these results suggest that student ratings of their behavioral/cognitive engagement, as assessed with the InSitu instrument, were positively related to their ratings of emotional engagement, whereas disengagement seemed to be unrelated to the other two latent factors.

Table 3

Within-level (below the diagonal) and between-level (above the diagonal) correlations between the three components of student engagement.

	Behavioral and cognitive engagement	Emotional engagement	Disaffection
Behavioral and cognitive engagement	—	0.236 **	-0.163 *
Emotional engagement	0.542 ***	—	-0.155 *
Disaffection	-0.136 **	-0.237 ***	—

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

3.2. Variation in engagement and academic achievement (between-students level)

Next, we conducted a two-level hierarchical multivariate model in which variation in behavioral/cognitive engagement, emotional engagement, and disaffection at between-students level was predicted by students' academic achievement, and variation within students between lessons was predicted by the subject being studied and time of the lesson within day. The impact of days of week was controlled for by entering them as dummy coded variables (fixed effects) into the multivariate model. The decision for constructing a two-level hierarchical model (with days included as dummy coded variables) instead of a three-level model (with days as an independent level) was based on small ICCs found between days of week and the study design which involved only one week of measurement for each participant (i.e., each day of week is represented only once for each participant). The multivariate two-level model was saturated. Total explained variances for this multivariate model were 8.9% for the behavioral/cognitive engagement, 12.3% for emotional engagement, and 13.3% for disaffection.

The results at the between-students level showed that students' academic achievement did not predict their ratings of behavioral/cognitive engagement or emotional engagement (after student gender was controlled for). However, students' academic achievement was statistically significantly related to disaffection ($\beta = -$

0.304, $p = 0.000$): students with higher academic achievement reported disaffection to a lesser extent than did students with lower academic achievement. Explained variances for between-students level were 3.4% for behavioral/cognitive engagement, 1.0% for emotional engagement, and 26.7% for disaffection.

3.3. Variation in engagement by school subject and time of day (within-students between-lessons level)

At within-students between-lessons level we tested the extent to which behavioral/cognitive engagement, emotional engagement, and disaffection were associated with the subjects being studied and time of the day (when day of week was controlled for). The explained variances for this level were 10.9% for behavioral/cognitive engagement, 14.7% for emotional engagement, and 9.1% for disaffection.

Variation in engagement with respect to particular school subjects was tested using paired comparison analyses which involved a set of contrasts which examined whether a particular school subject compared to another subject predicted variation in the three latent factors of engagement, (i.e., behavioral/cognitive engagement, emotional engagement, and disaffection¹). The results of the paired comparisons (see Table 4) showed that two non-academic subjects – home economics and physical education – differed from academic subjects with respect to students' situational engagement. Students rated their behavioral/cognitive engagement and emotional engagement higher and disaffection lower when attending home economics lessons or physical education lessons than when attending lessons of academic subjects. Paired comparisons showed further that students rated their behavioral/cognitive engagement lower in mathematics when compared to lessons of English and science (Table 4). The results, thus, suggested that mathematics was the subject with lowest student ratings of situational engagement. The amount of variance explained by the school subjects was 7.6% for behavioral/cognitive engagement, 11.2% for emotional engagement, and 2.8% for disaffection.

To gain understanding of variation in engagement in those school subjects which in the previous analyses had been combined into larger subject areas, additional pairwise comparisons were conducted. These paired comparisons showed higher ratings of behavioral/cognitive engagement for physics lessons when compared to mathematics ($\beta = -0.304$, $p < 0.05$), whereas similar results were not found for biology. This suggests that results concerning science were mostly due to physics.

At the within-students between-lessons level, we also analyzed associations between situation-specific engagement and the time of day. The results did not indicate significant effects for the time of day on students' situation-specific engagement when the effects of the teacher, the subject being studied, and day of the week had been taken into account.

4. Discussion

The majority of prior research in the field has focused on student engagement as a general attitude to learning or an overall sentiment towards school (e.g., Fredricks & McColskey, 2012). An emerging trend in the field of engagement during the past years is

an interest in malleability and sensitivity to situational effects as a critical feature of student engagement (Fredricks et al., 2004; Fredricks & McColskey, 2012). Empirical research on the situational factors affecting fluctuation of engagement is, however, still rare. The aim of the present study was to examine the extent to which students' engagement varies between students (inter-individual variation) and from one lesson to another (intra-individual variation). Variation in engagement between students was predicted by their academic achievement and variation within students and between lessons was predicted by subject being studied and time of day. The findings of the study provide new understanding of situational variation in student engagement by showing that the largest proportion of variation in engagement was found within students between lessons, and that this variation was related to the school subjects being studied. There was also a substantial variation between students' situational engagement which, in particular for disaffection, was associated with the students' academic performance. Overall, our findings suggest that, in addition to inter-individual differences in student engagement, it is particularly important to take into account the intra-individual, situation-specific variation from one lesson to another.

One key finding of the study was that students' self-reports of engagement differed between school subjects. Overall, students reported highest situational engagement and lowest disaffection in lessons of non-academic subjects. For example, they were likely to report higher behavioral/cognitive engagement, emotional engagement, and lower disaffection in physical education and home economics lessons in comparison to lessons of other subject areas. Moreover, they were likely to report lower behavioral/cognitive engagement in mathematics lessons than in many other subjects/subject areas (in addition to home economics, and physical education also in comparison to English, science, and arts and crafts). Our results corroborate recent findings in the literature by indicating that engagement varies within students over short periods of time (Martin et al., 2015; Vasalampi et al., 2016).

Several possible explanations may account for variation in situation-specific engagement by school subjects. First, non-academic subjects may be likely to engage students more, because they are less demanding in terms of effort and work load, whereas academic subjects may lead to lower engagement because of high demands for exertion and a higher likelihood of negative feedback in the case of failure. Our results, particularly those concerning physical education and home economics, corroborated prior findings by Shernoff et al. (2003) who documented that students reported higher situational concentration, interest, and enjoyment in non-academic subjects compared to academic subjects.

Second, lower student ratings of behavioral and cognitive engagement in mathematics lessons may be related to instructional practices typical for this particular subject. Mathematics instruction often consists of teacher-led recital and tasks, predominantly focusing on tasks requiring abstract thinking and conceptual learning, rather than on learning by exploring or accommodating tasks to take student perspectives into account. This type of instruction runs a high risk for impeding students' engagement in the lessons (cf., Hafen et al., 2012; Lam et al., 2012b).

Finally, higher behavioral/cognitive and emotional engagement, as well as lower disaffection, were reported in lessons of subjects which emphasize learning by doing (e.g., home economics) or learning through exploring and experimenting (e.g., physics). In earlier literature such learning methods have been associated with higher overall engagement (e.g., Fredricks et al., 2004; Lam et al., 2012b; Newmann et al., 1992; Taraban, Box, Pollard, & Bowen, 2007). The present findings, thus, suggest in line with earlier literature that learning situations in the school that allow and

¹ The estimates of paired comparisons were calculated on the basis of beta values for the dummy coded school subjects. The estimates presented in Table 4 resemble d-value of the paired comparison; in this case, between the two respective school subjects in question. The value of the estimate can be interpreted as effect size d (out of total variation at within-student between-lessons level) of the difference that the pairwise comparisons have on the three factors of engagement (i.e., dependent variables).

Table 4
Paired comparison analyses between the school subjects in student ratings of engagement.

		2 Mathematics	3 English	4 Swedish	5 Science	6 Humanities	7 Home economics	8 Arts and crafts	9 Physical education
1. Finnish (mother tongue)	Behavioral/Cognitive				-0.197 [†]		-0.470 ***		-0.498 **
	Emotional						-0.586 ***		-0.770 ***
	Disaffection	-0.159 [†]					0.197 *		0.359 *
2. Mathematics	Behavioral/Cognitive		-0.228 *		-0.272 *		-0.546 ***		-0.574 **
	Emotional		-0.203 [†]		-0.213 [†]		-0.690 ***	-0.220 *	-0.875 ***
	Disaffection						0.356 **		0.518 ***
3. English	Behavioral/Cognitive						-0.317 **		-0.345 *
	Emotional						-0.487 ***		-0.672 ***
	Disaffection						0.220 [†]		0.382 **
4. Swedish	Behavioral/Cognitive						-0.502 ***		-0.530 **
	Emotional						-0.726 ***	-0.256 *	-0.911 ***
	Disaffection						0.269 **		0.431 **
5. Science	Behavioral/Cognitive						-0.274 **		
	Emotional						-0.476 ***		-0.661 **
	Disaffection						0.183 [†]		0.345 *
6. Humanities	Behavioral/Cognitive						-0.372 **		-0.400 *
	Emotional						-0.500 ***		-0.685 ***
	Disaffection						0.230 *		0.393 *
7. Home economics	Behavioral/Cognitive								
	Emotional								
	Disaffection								
8. Arts and crafts	Behavioral/Cognitive						-0.350 ***		-0.378 *
	Emotional						-0.470 ***		-0.655 ***
	Disaffection						0.263 **		0.426 **
9. Physical education	Behavioral/Cognitive								
	Emotional								
	Disaffection								

Note. The subject or subject areas on the horizontal axis are compared to the subjects on the vertical axis. Subject areas: science (physics and biology combined), humanities (history and health education combined), arts and crafts (visual arts and crafts combined). Negative numbers suggest lower situational ratings for a subject on the horizontal axis when compared to a subject on the vertical axis (e.g., ratings of behavioral and cognitive engagement are significantly lower in mathematics when compared to science). Numbers represent means of standardized factor scores ($M = 0$, $SD = 1$); the higher/lower the number, the higher/lower the value of the particular subject compared to the other subject in the pairwise comparison. No reported value means no significant difference between subjects.

[†] $p < 0.06$. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

reinforce active participation and effort are likely to increase students' intrinsic motivation and engagement in the classroom context (cf., Ryan & Deci, 2000).

Contrary to our expectations, the time of the day did not explain variation in students' situation-specific engagement. In this respect, our findings were in line with those of Martin et al. (2015). Similarly to conclusions by Martin et al. (2015), our findings suggest that it is not the time of the lesson that matters but rather what the particular lesson demands and affords for the students.

Based on prior literature (e.g., Virtanen et al., 2014), we expected that higher academic achievement would be associated with higher student-reported situation-specific engagement. Our findings indicated that after controlling for students' gender, their academic achievement did not predict their level of behavioral/cognitive or emotional engagement in the lessons. However, achievement was related to the students' level of disaffection. Students with lower academic achievement tended to experience more negative emotions and were less likely to focus on the ongoing tasks and instruction in comparison to students with higher achievement. This higher occurrence of behaviors and emotions relating to maladaptive motivational state among students with lower achievement is in line with notions arguing that lower achievement is reciprocally associated with higher task avoidant behavior (cf. Onatsu-Arvilommi & Nurmi, 2000).

The present findings are informative also with respect to the ongoing debate on measurement of student engagement (see more e.g., Azevedo, 2015; Fredricks & McColskey, 2012; Sinatra, Heddy, & Lombardi, 2015). Sinatra et al. (2015) urge researchers to position themselves with respect to level of measuring student engagement that they represent on the continuum ranging from person-oriented to person-in-context and context-oriented perspectives. In the present study engagement was approached from the person-in-context perspective, as our focal interest centered on the situational variation of engagement and the specific individual and situational factors that predict that variation (cf., Sinatra et al., 2015). Our findings indicated that the largest proportion of variation in behavioral/cognitive and emotional engagement, and disaffection was found between lessons, whereas inter-individual differences capture a smaller part of variation of engagement of lower secondary school students' experiences. As engagement can be assumed to evolve based on the feedback received in everyday learning, the use of measures sensitive to situational variation can be assumed to be critical in any effort to understand how long-term attitudinal stances towards school develop in transactional processes between the student and their environment. With the current data, we were able to model different aspects of situational engagement, including behavioral and cognitive engagement, emotional engagement, and disaffection. Along with some earlier studies (e.g., Martin et al., 2015), our findings suggests that an understanding of malleability of engagement can be increased by focusing on engagement in situ.

4.1. Limitations

This study involves some limitations. Firstly, the InSitu instrument, which was developed for the purpose of assessing situation-specific engagement in classrooms, has not yet been widely used in previous research. For the most part, the instrument was found to reliably capture the intended dimensions, but it did not distinguish between cognitive and behavioral engagement (see more Vasalampi et al., 2016). Secondly, the situational and individual factors that were selected for this study represent only a small number of potentially relevant factors present in the learning environments of school. For example, in the future it would be useful to complement the assessment of situation-specific engagement

with observational data on the quality of teaching to allow analysis of the role of instructional practices on student engagement. Thirdly, the results of the present study are based on students' self-ratings. In future research, data with other person-in-context measures (e.g., situational data collected from teachers' ratings of students' engagement and classroom observations) would be needed (cf., Sinatra et al., 2015). Finally, it is important to note that the present study was carried out in a Finnish school context, which differs from some other educational and cultural contexts. For example, in Finland, the differences between schools in terms of student achievement and teacher qualifications are typically relatively small, and class sizes are somewhat smaller than those in many other OECD countries (OECD, 2012).

4.2. Conclusions

The present study moved beyond general engagement to explore students' situation-specific engagement during a one-week intensive follow-up in authentic classroom contexts. Our findings confirmed that there is significant variation in students' behavioral/cognitive and emotional engagement, and disaffection across different lessons during a day, and that this variation could partly be explained by the subject of the lesson. Furthermore, the findings imply, first, that active support for engagement is needed especially for lower achieving students, and, second, that engagement should be supported particularly in academic subjects which do not lend themselves as easily to exploration and learning by doing.

The understanding gained from students' situation-specific experiences of engagement can lead to several implications. First, it can provide knowledge for teachers concerning factors that contribute to engagement in classroom environment, and by doing so may help to find optimal ways of fostering engagement and individualized support in the lessons. Second, the results of this study, and future investigations on situation-specific engagement, provide insight into the malleability of engagement and factors that are important in processes of evolving engagement. Such knowledge would be important for developing in-service interventions, e.g., those supporting engagement by focusing on promotion of students' active participation or improving instructional methods. Prior studies on interventions of dialogic teaching, for instance, have also shown that intentional effort and support are needed for both teachers' reflection of their practices and for engaging students in educational dialogue (e.g., Lehesvuori, Viiri, & Rasku-Puttonen, 2011). By collecting and utilizing situation-specific information in classroom settings teachers receive valuable evidence from students' responses to instruction. Thus, tools such as InSitu that move beyond general engagement to explore students' situation-specific engagement will be helpful in both initial and in-service teacher training for promoting engaging modes of teaching and in designing models for preventing students' disengagement from learning and participation in school.

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II

TEACHER-STUDENT INTERACTION AND LOWER SECONDARY SCHOOL STUDENTS' SITUATIONAL ENGAGEMENT

by

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FINAL DRAFT

Teacher-Student Interaction and Lower Secondary School Students' Situational Engagement

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ABSTRACT

Background. Prior research has shown that engagement plays a significant role in students' academic learning.

Aims. The present study sought to expand the current understanding of students' engagement by examining how situational engagement during a particular lesson is associated with the observed teacher-student classroom interactions (i.e., emotional support, instructional support, and classroom organization) in the same lesson.

Sample. The participants were 709 Grade 7 students (47.7% girls) from 59 classrooms in 26 lower secondary schools and 51 teachers.

Methods. The data consisted of 155 video-recorded lessons (90 language arts and 65 mathematics lessons) coded using the Classroom Assessment Scoring System – Secondary (CLASS-S) observational instrument. Students' self-ratings of their situation-specific engagement were collected using the mobile-based In Situations (InSitu) Instrument at the end of each lesson. The data were analyzed with cross-classified two-level hierarchical modelling.

Results and conclusions. The results indicated that emotional support in the classroom was positively associated with students' emotional engagement and help-seeking, whereas classroom organization was associated with students' behavioural and cognitive engagement. Overall, the findings provide novel evidence suggesting that students' engagement can be fostered by supportive teacher-student interactions.

Teacher-Student Interaction and Lower Secondary School Students' Situational Engagement

Evidence from prior research indicates that students' engagement contributes to their learning and academic success (e.g., Fredricks, Blumenfeld, & Paris, 2004). Students exhibiting high engagement receive better grades (Li & Lerner, 2010), manifest higher academic competence (Li, Lerner, & Lerner, 2010), and invest more effort in learning (Skinner, Kinderman, & Furrer, 2009). Further understanding of the key factors that promote or impede students' engagement in different learning situations is, however, still needed (e.g., Eccles & Wang, 2012). One factor that may contribute to students' engagement and its fluctuation across lessons is teacher-student interaction in the classroom (Fredricks et al., 2004; Pianta, Hamre, & Allen, 2012; Skinner et al., 2009). In order to add to the literature on the role of classroom-level factors in students' situational engagement, the present study set out to examine the extent to which the teacher-student interactions (i.e., emotional support, instructional support, and classroom organization) during a particular lesson in lower secondary school are associated with students' situational engagement in the same lesson.

Student Engagement

According to the widely employed definition by Fredricks et al. (2004), student engagement consists of three distinct, yet interrelated components of students' commitment and involvement with school and learning, namely, behavioral, emotional, and cognitive engagement (see also Wang, Willett, & Eccles, 2011). *Behavioral engagement* refers to students' positive conduct and actions towards school and learning (e.g., attending classes, concentrating, and completing schoolwork), and involvement in academic and social activities in the classroom and school in general (e.g., attending and contributing to class discussions) (Fredricks et al., 2004; Wang et al., 2011). *Cognitive engagement* encompasses students' self-regulated and strategic approach to learning, such as the pursuit and effort to comprehend complex ideas and master difficult skills (Appleton, Christenson, & Furlong, 2008; Archambault et al., 2009). The third component termed alternatively as *emotional or affective engagement* focuses on students' sentiments toward school, such as feelings of happiness, interest, or anxiety, and sense of belonging with other students, teachers, and the school. In some conceptualizations, this component also involves students' perceived support from important others (Appleton, Christenson, Kim, & Reschly, 2006; Finn 1989; Skinner & Bellmont, 1993).

Students' engagement has been seen as shaped by student-related individual factors such as their gender, academic ability or ethnicity (e.g. Wang & Eccles, 2013). In a study by Lam et al. (2014), for instance, gender difference in engagement was present in data collected from 12 countries. Their results showed that engagement of girls was higher than that of boys in students' self-ratings as well as ratings made by their teachers. It has also been suggested that perceptions of support from teachers and peers may be different among girls and boys (Rueger, Malecki, & Demaray, 2010).

According to Fredricks et al. (2004) engagement is presumed to be malleable, and recent research has indicated that student engagement varies situationally from one learning situation to another (e.g., Vasalampi et al., 2016; Pöysä et al., 2018; Martin et al., 2015; Schernoff et al., 2016). Thus, in everyday learning at school, this fluctuating engagement can be shaped by factors such as structural features of the classroom, and factors related to the interactions between teachers and students (Fredricks et al., 2004). However, the existing findings on the role of these factors are still inconclusive because they have often been drawn based on ratings of engagement as a general or overall trait (i.e., ratings of overall engagement across typical school situations), rather than on situation-specific ratings of engagement (i.e., ratings of lesson-by-lesson experiences).

In the present study, students' situational engagement was approached by focusing on students' individual experiences of their behavioral and cognitive engagement, emotional engagement, competence experiences, disaffection, and help-seeking during a particular lesson. Tripartite conceptualization of engagement (i.e., behavioral, cognitive and emotional engagement; e.g., Wang et al., 2011) was extended in order to reach different aspects of situationally fluctuating engagement in the lessons. These extensions assumed to be relevant for student situation-specific engagement comprised in situational experiences of *competence*, focusing on students' expectations for success during the lesson (cf., Eccles et al., 1993), situational *disaffection*, including both, behaviors and emotions identified in literature on students' maladaptive motivational states and engagement (cf., Skinner et al., 2009), and situational *help-seeking*, focusing on seeking support from peers or their teacher during the lesson (cf., Marchand & Skinner, 2007).

Student Engagement and Teacher-Student Interactions

Among the critical factors assumed to contribute to student engagement is teacher-student interactions in the classroom (e.g., Furrer, Skinner, & Pitzer, 2014; Niemiec & Ryan, 2009; Skinner & Pitzer, 2012; Wang & Eccles, 2013). In prior literature understanding of classroom practices and interactions contributing to student learning has been approached from various perspectives, both theoretically and operationally (see, e.g., Corso et al., 2013; Cronbach & Snow, 1977; Fredricks et al., 2004; Pianta, Hamre, & Allen, 2012; Shernoff et al., 2016), with one of the more recent ones being the *Teaching Through Interaction (TTI)* framework (Allen et al., 2013; Hafen et al., 2015; Pianta, Hamre, & Mintz, 2012). The TTI framework conceptualizes teacher-student interactions in the classroom through three components: emotional support, classroom organization, and instructional support. Emotional support focuses on ways in which classroom practices foster and facilitate students' social and emotional functioning (Hamre et al., 2013). When teacher-student interaction contains emotional support, students are, for example, willing to express their academic, social, and emotional needs and teacher responds to such needs. Classroom organization focuses on interactions and practices related to effective ways of organizing and managing classroom situations (Allen et al., 2013; Hafen et al., 2015). Fostering of students' positive behavior and supporting their functioning via clear routines, for instance, can be seen as indicators of classroom organization. Finally, instructional support focuses on ways of which the teacher utilizes instructional strategies

and feedback to support students' learning (Allen et al., 2013; Hafen et al., 2015). These include, for example, opportunities for students to extend their prior knowledge and participate in discussions expanding their understanding. The components of TTI framework are operationalized in the Classroom Assessment Scoring System (CLASS; e.g., Hamre et al., 2013) which assesses key aspects of teacher-student interactions at classroom level (see descriptions for dimensions in Table 1).

Table 1. Dimensions of Classroom Assessment Scoring System – Secondary (CLASS-S) measure (Allen et al, 2013; Pianta et al., 2012)

Domain	Dimension	Description and examples of indicators
Emotional Support	Positive Climate	The warmth, respect and emotional connection in relationships among teachers and students.
	Teacher Sensitivity	Responsiveness to the students' academic, emotional, and developmental cues and needs.
	Regard for Students Perspectives	Teacher's ability to meet students' developmental and social needs, e.g., by providing opportunities for student autonomy and leadership.
Organizational Support	Behavior Management	Teacher's ability to use effective methods with encouraging desirable behavior and prevent/redirect misbehavior.
	Productivity	Teacher's ways of managing time and routines in a way that instructional time is maximized.
	Negative Climate	Overall level of negativity within teacher-student interaction.
Instructional Support	Instructional Learning Formats	Supporting students' engagement in learning through active facilitation, varying and interesting materials, and overall clarity.
	Content Understanding	Ways of supporting students to comprehend framework, key ideas, and procedures connected to content.
	Analysis and Inquiry	Students' possibilities to engage in higher-level thinking through analysis and inquiry.
	Quality of Feedback	The degree to which feedback expands and extends learning and encourages student participation.
	Instructional Dialogue	Cumulative content-focused discussions among teachers and students that lead to a deeper understanding of the content

The TTI can provide a promising framework for examining the relation between features of classroom interactions and variation in situational engagement, as it focuses on aspects of teacher-student interactions that have consistently been documented as being associated with student engagement as well (c.f., Fredricks et al., 2004; Lam et al., 2012; Skinner & Pitzer, 2012). Few prior studies have focused on this relation by utilizing the TTI framework and measures of student engagement. Virtanen et al. (2013), for instance, demonstrated positive associations between both classroom organizational and instructional support and student-rated, teacher-rated, and observed general behavioral engagement among lower secondary school students. Furthermore, it has been suggested

that that students' general engagement is higher when they study in an emotionally supportive learning environments (e.g., Lam et al., 2012; Skinner & Pitzer, 2012), and that emotionally supportive learning environments might be particularly important for girls (Roorda, Koomen, Spilt, & Oort, 2011).

In line with propositions concerning situational variations and the malleability of engagement (e.g., Vasalampi et al., 2016; Martin et al., 2015), the TTI framework acknowledges that the teacher-student interaction may vary from one lesson to another (Curby et al., 2011; Pianta, Hamre, & Mintz, 2012). However, the vast majority of previous research examining links between engagement and teacher-student interactions has employed student ratings of overall or general student engagement, and very few studies have contained parallel assessments of teacher-student interactions and students' engagement in a particular lesson. In a recent study by Rimm-Kaufman, Baroody, Larsen, Curby and Abry (2015), the authors collected simultaneous data of observed teacher-student interactions and the 10-year-old students' self-reported engagement in a mathematics lesson. Although situational engagement was the focus of this study, their results suggested that emotional support and classroom organization were positively related to students' engagement in a particular lesson. In a similar vein, Malmberg et al. (2010) found that observed student engagement was higher in lessons with high emotional support, classroom organization, and instructional support as all assessed using the CLASS. Higher classroom organization was also related to less variability in the students' observed engagement during the lessons (both were assessed one to four times per lesson). The present study moves beyond these studies by focusing specifically on situational engagement in lower secondary school classroom and examining the extent to which students' experiences of their situational engagement during a particular lesson can be explained by the classroom-level teacher-student interactions during the same lesson.

The Present Study

The aim of the present study was to examine the extent to which the teacher-student interactions (emotional support, classroom organization, and instructional support) in a particular lesson are associated with students' situation-specific engagement at the end of the same lesson. Observations were conducted in the language arts and mathematics lessons in Grade 7. Based on previous findings, we expected that students' situation-specific engagement would be positively associated with observed classroom emotional support (Hypothesis 1a; Lam et al., 2012; Rimm-Kaufman et al., 2015; Tucker et al., 2002), classroom organization (Hypothesis 1b; Malmberg et al., 2010; Virtanen et al., 2013), and instructional support (Hypothesis 1c; Virtanen et al., 2013). In addition, we examined whether associations between the teacher-student interactions and situation-specific engagement would differ between boys and girls.

Method

Participants and Procedure

The present study was part of a longitudinal First steps follow-up study (Lerkkanen et al., 2006-2016), which comprises approximately 2,000 students along with their parents and teachers from four municipalities in different parts of Finland. The aim of the follow-up study was to investigate the development of learning and motivation in the contexts of school and home from the kindergarten year to the end of lower secondary school. The study was approved by the Committee of Ethics in University of Jyväskylä, and only those students whose guardians had given their written consent for their children's participation were involved in the study.

The present analyses concern data on 709 students (338 girls, 371 boys) from 26 lower secondary schools and 59 Grade 7 classrooms. The subsample of classrooms and the respective students, drawn from the larger sample of the longitudinal study, was based on the sample of subject teachers' (teaching mathematics or language arts) who volunteered to participate in video recordings of their ordinary lessons. No statistically significant differences were found in educational background or years of work experience between those teachers ($N = 51$; 35 female, 16 male) who agreed to participate in classroom video recordings and other Grade 7 subject teachers who participated in the follow-up only by filling out questionnaires.

The average age of the participating students' was 13 years and 2 months ($SD = 4$ months) at the beginning of Grade 7. They all attended general education in mainstream Finnish-speaking schools. The present subsample of students was representative of the larger longitudinal study with respect to maternal educational level. In the present subsample, a total 71% of mothers ($N = 503$) had provided information concerning their educational level. Of these mothers 29 (5.8%) had a low educational level (i.e., no vocational degree), 335 (65.9%) had an intermediate educational level (i.e., vocational school degree, vocational college degree, and Bachelor's degree), and 126 (27.4%) had a high educational level (i.e., Master's, Licentiate's or Doctor's degree). The sample was representative of the Finnish population (Statistics in Finland, 2015) with respect to the distribution of maternal education.

A total of 155 lessons (90 language arts and 65 mathematics lessons) were video-recorded during March–May of 2014. The most of the lessons lasted 45 minutes (except for six language arts and four mathematics lessons lasting 75 minutes). The video-recorded lessons were coded for teacher-student interactions using the Classroom Assessment Scoring System – Secondary (CLASS-S; Pianta, Hamre, & Mintz, 2012) observational tool. At the end of each video-recorded lesson, the students completed self-ratings of their situation-specific engagement using the mobile-based In Situations (InSitu) Instrument (Lerkkanen et al., 2012; Vasalampi et al., 2016). The data for the present study contained a total of 1,647 time-stamped ratings of students' situation-specific engagement ($M = 2.32$ ratings for a student, range 1–9, $SD = 1.56$).

Measures

Situational engagement

Students' self-rated situation-specific engagement was measured at the end of each video-recorded lesson. The ratings were made using a mobile application of the In Situations (*InSitu*) Instrument (Lerkkanen et al., 2012; Vasalampi et al., 2016). The application was preprogrammed into smartphones, which were used only for research purposes. Students were asked to rate their experiences concerning the whole lesson, and in addition, to provide identification information.

The InSitu consists of 17 items rated on a 5-point scale (1 = *not at all*; 5 = *very much*). It assesses the following five components of students' situation-specific experiences: (1) behavioral/cognitive engagement (7 items, e.g., "How persistent were you in studying during the lesson?"; "How important did you find the studied contents?", $\alpha = .81$); (2) emotional engagement (3 items, e.g., "How much did you like the lesson?", $\alpha = .85$); (3) competence experiences (2 items, "How easy was the lesson for you?", $\alpha = .81$); (4) disaffection (3 items, e.g., "How boring was the lesson?", $\alpha = .67$); and (5) help-seeking (2 items, e.g., "How much did you ask for help from the teacher/another adult during the lesson?", $\alpha = .76$). The first two components are directly drawn from the tripartite conceptualizations of engagement (e.g., Wang et al., 2011), while the three latter components are closely related to or facilitate engagement by capturing students' experiences of competence in the lessons (cf., Eccles et al., 1993), disaffection (maladaptive behaviors and emotions; cf., Skinner et al., 2009), and help-seeking (cf., Marchand & Skinner, 2007), respectively. The factor scores of these five components of student engagement were used in the subsequent analyses.

The InSitu instrument has been validated in the Finnish context (see Vasalampi et al., 2016), and confirmatory factor analyses (CFA) verified the expected five-factor solution for the used data (Vasalampi et al., 2016).

Teacher-student interactions

The assessment of teacher-student interactions at the classroom level was conducted by coding the video-recorded lessons using the Classroom Assessment Scoring System – Secondary (CLASS-S; Pianta, Hamre, & Mintz, 2012). The CLASS-S contains the following three domains and their respective dimensions each of which focuses on different features of effective teacher-student interactions: Emotional Support (3 dimensions: Positive Climate, Teacher Sensitivity, and Regard for Adolescent Perspectives); Classroom Organization (3 dimensions: Behavior Management, Productivity, and Negative Climate [reversed for analysis]); and Instructional Support (5 dimensions: Instructional Learning Formats, Content Understanding, Analysis and Inquiry, Quality of Feedback, and Instructional Dialogue). The CLASS-S also includes a dimension of Student Engagement, which does not belong under any of the three domains. Short descriptions for the dimensions are presented in Table 1. The CLASS-S has been validated in the Finnish context (Virtanen et al., 2017).

The classroom-level assessment of each of the dimensions was conducted on a 7-point scale (*Low* 1–2, *Mid* 3–5, or *High* 6–7) in line with the CLASS-S manual (Pianta,

Hamre, & Mintz, 2012). The coding is based on the indicators of effective interactions and observable behavioral markers provided in manual. Each dimension was scored individually. Furthermore, the CLASS-S manual (Pianta et al., 2012) recommends that each lesson is divided into cycles (approximately 15 minutes) which are observed and scored independently to ensure reliability of observations. In the present data, the 45-minute video-recorded lessons were divided into three cycles (with length between 8 and 15 minutes depending on the exact length of the lesson), and 75-minute lessons into five cycles to produce maximal observation time. The average time for each cycle was 13 minutes 52 seconds ($SD = 1$ minute 25 seconds). The unit of observation was one cycle, and thus, for most lessons (145 out of 155) each item (i.e., dimensions) was observed three times during a lesson (remaining 10 lessons included five scoring cycles). For analyses, ratings across the cycles within each lesson were aggregated to produce average lesson-specific score for each dimension.

Ratings were performed by a group of trained coders following the CLASS-S procedure. Prior to actually coding the present data, the coders (eight female graduate and post-graduate students in the field of education or psychology) participated in rigorous training in which they familiarized themselves with the TTI framework and the CLASS-S manual guidelines and procedures. The training consisted of seven training sessions and several independent ratings of videotapes. Before continuing to code actual data the coders were required to reach 80% agreement or higher with at least four master coded cycles and also between each other (Pianta, Hamre, & Mintz, 2012). Twenty percent (20%) of the lessons were double-coded by two independent coders. Interrater reliability was calculated with intraclass correlations (ICCs; Landers, 2015) and Krippendorff's alpha (Hayes & Krippendorff, 2007). Both of these indicators showed high interrater reliability ($\alpha_{icc} = .895$ and $\alpha_{Krippendorff} = .862$).

Preliminary analyses

Factor scores for InSitu factors

Factor scores (sum scores) of students' situational engagement were calculated based on the five-factor solution. Factor scores were used in subsequent analyses in order to allow more degrees of freedom for the modelling.

Treatment of correlating CLASS-S domain scores

Similarly to earlier studies (e.g., Rimm-Kaufmann et al., 2015; Virtanen et al., 2017), our preliminary analyses showed high correlations between CLASS-S domain scores (emotional support, classroom organization, and instructional support). Cross-domain correlations suggested multicollinearity between the domains, and reaching a satisfactory fit for the expected three-factor solution would have required freeing the residual correlations. Thus, we decided to model each CLASS-S domain separately (for a similar procedure, see, e.g., Rimm-Kaufmann et al., 2015).

Statistical Analyses

Because of nested data, we applied two-level hierarchical modelling using the Mplus statistical program (version 7.3; Muthén & Muthén, 1998–2012). At the *within level* variation was modelled within students across different lessons. The *between level* contained two factors, student and teacher, which were cross-classified with each other. In cross-classified two-level modelling, these two factors could be modelled simultaneously. The reason for using cross-classified hierarchical modelling was that one subject teacher could teach more than one group of students, and one group of students was taught by more than one subject teacher (for different subjects, respectively). In cross-classified modelling, at the between level we were able to separate variation due to variation between subjects and variation between teachers.

The standard missing at random (MAR) approach was applied, and the parameters of the models were estimated using full information maximum likelihood (FIML) estimations. Cross-classified hierarchical modelling provided a means to deal with the unequal number of measurements across students (Hox, 2010). The analyses were conducted with the Bayesian estimation; therefore, the goodness of fit of the estimated models could only be evaluated with Bayesian posterior predictive checks (Muthén & Asparouhov, 2012).

The first level of our hierarchical model was the *within level*, which tested the extent to which the observed teacher-student interactions (i.e., emotional support, classroom organization, and instructional support) predicted variations in student's situation-specific engagement (i.e., intra-individual variation). Gender interaction effects were added to the model to investigate whether the associations between the teacher-student interactions and students' situation-specific engagement differed between boys and girls. The second level of the cross-classified model (between level) modelled variations *between students* and *between teachers*. At this level variation due to student gender was modelled between students. Moreover, based on preliminary analyses, the effects of the subject being studied (language arts or mathematics) were controlled for between teachers.

Cross-classified two-level hierarchical modelling using a similar procedure was conducted separately for the three CLASS-S domains: Emotional Support, Classroom Organization, and Instructional Support. Estimations of each cross-classified three-level hierarchical model provided a good fit according to Bayesian posterior predictive checks (Emotional Support, $p = .413$; Classroom Organization, $p = .219$; and Instructional support, $p = .316$), the p-value for optimal fit being .500.

Results

Descriptive Statistics

Descriptive statistics for students' situation-specific engagement and teacher-student interaction are shown in Table 2. Students' situation-specific engagement ranged, on average, from 1.84 to 3.69 in language arts lessons, from 1.89 to 3.53 in mathematics lessons, and from 1.86 to 3.62 when the two subjects combined. The mean value for observed teacher-student interaction in language arts lessons was 4.53 for emotional support (*SD*

Table 2. Descriptive statistics and correlation matrix for students' experiences of their situational engagement and for observed teacher-student interaction in class-level

	LANGUAGE ARTS				MATHEMATICS				SUBJECTS COMBINED				CORRELATION				
	n	M	SD	me- dian	n	M	SD	me- dian	n	M	SD	me- dian	1.	2.	3.	4.	5
InSitu																	.
1.Behavioral/cognitive engagement	949	3.14	.76	3.14	698	3.15	.76	3.14	1647	3.14	.76	3.14	1				
2.Emotional engagement	949	3.06	.91	3.00	698	2.97	.94	3.00	1647	3.02	.92	3.00	.609**	1			
3. Competence experiences	949	3.69	.89	3.50	698	3.53	.98	3.50	1647	3.62	.93	3.50	.579**	.538**	1		
4. Disaffection	949	2.28	.83	2.33	698	2.31	.81	2.33	1647	2.29	.82	2.33	-.179**	-.274**	-.127**	1	
5. Help-seeking	945	1.84	.85	1.50	695	1.89	.89	1.89	1640	1.86	.86	1.50	.022	.057*	-.184**	.404	1
CLASS-S domains																	
1. Emotional Support	91	4.38	.91	4.44	67	4.22	.89	4.33	158	4.31	.90	4.37	1				
2. Classroom organization	91	5.81	.77	5.80	67	6.03	.90	6.22	158	5.90	.83	6.03	.609**	1			
3. Instructional Support	91	3.72	.73	3.72	67	4.22	.76	4.21	158	3.94	.78	3.93	.615**	.523**	1		

Note. InSitu used to measure students' situational engagement on a student-level. CLASS-S used to measured teacher-student interaction on class-level. Unit of observation was one cycle. Values for different cycles from each lesson combined as lesson-specific average. * $p < .05$, ** $p < .01$, *** $p < .001$

= .92), 5.81 for classroom organization ($SD = .77$), and 3.70 for instructional support ($SD = .71$). In mathematics lessons, the mean value for observed teacher-student interaction was 4.43 for emotional support ($SD = .90$), 6.03 for classroom organization ($SD = .90$), and 4.19 for instructional support ($SD = .76$). When two subjects were combined, the mean value for observed teacher-student interaction was 4.31 for emotional support ($SD = .90$), 5.90 for classroom organization ($SD = .83$), and 3.94 for instructional support ($SD = .78$). The results indicated that the instructional support was statistically significantly higher in mathematics lessons than in language arts lessons ($\beta = .463$, 95% CI [.214, .637]). No mean level differences emerged for emotional support and classroom organization. Intra-individual variations for the five dimensions of situational engagement ranged from moderate to high (Table 3), suggesting that student engagement varied from one lesson to another. Between-student variation for different dimensions of engagement varied from moderate to high, indicating that students differed from each other in their engagement, independent of the lesson. Proportions of teacher-student interaction variance ranged from low to moderate within teachers, but variance was uniformly high between teachers. Thus, these findings suggest that the teacher-student interactions varied to some extent from one lesson to another (instructed by the same teacher), but more substantially from one teacher to another (Table 4).

Table 3. Proportions of variance for Students' Situational Engagement (measured with InSitu)

	Behavioral/ cognitive en- gagement	Emotional engagement	Competence experiences	Disaffection	Help-seek- ing
within _{students}	.396	.410	.534	.535	.509
between _{students}	.486	.420	.371	.366	.354
between _{teachers}	.118	.170	.095	.099	.137

Note. Values are significant according to the Bayesian Credibility Interval (95%).

Table 4. Proportions of variance for Observed Teacher-Student Interactions in Emotional Support, Classroom Organization, and Instructional Support (Measured with CLASS-S)

	Emotional support	Classroom organization	Instructional support
between _{teachers}	.767	.807	.678
within _{teacher}	.233	.193	.322

Note. Values are significant according to the Bayesian Credibility Interval (95%).

Teacher-Student Interactions as a Predictor of Student Engagement

First, we investigated the associations between the teacher-student interactions (e.g., emotional support, classroom organization, and instructional support) and students' situation-specific engagement. The results showed, first, that emotional support was positively related to students' emotional engagement and help-seeking ($\beta = .140$, 95% CI

[.068, .214] and .109, 95% CI [.037, .181], respectively): the higher the observed emotional support in a classroom, the higher the students' emotional engagement and help-seeking (Figure 1). No significant relations emerged between emotional support and students' behavioral/cognitive engagement, competence experiences, and disaffection.

Second, the modelling indicated that classroom organization was positively associated with students' behavioral/cognitive engagement ($\beta = .079$, 95% CI [.016, .154]): the higher the classroom organization in a classroom, the higher the students' behavioral and cognitive engagement (Figure 2). No significant relations emerged between classroom organization and other dimensions of situational engagement. Instructional support in the classroom was not significantly associated with students' situation-specific engagement (Figure 3).

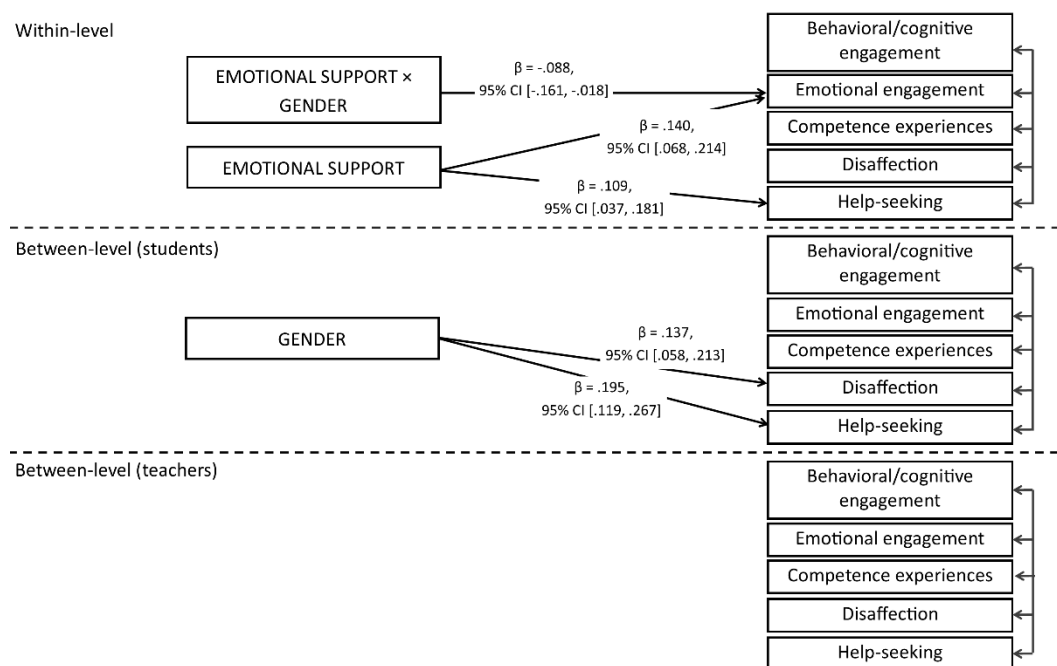


Figure 1. Cross-classified hierarchical model for emotional support.

Estimates are standardized. Positive values from gender to factors of situation-specific engagement in the between level (students) mean that boys have reported higher values than girls, and negative values mean that boys have reported lower values than girls.

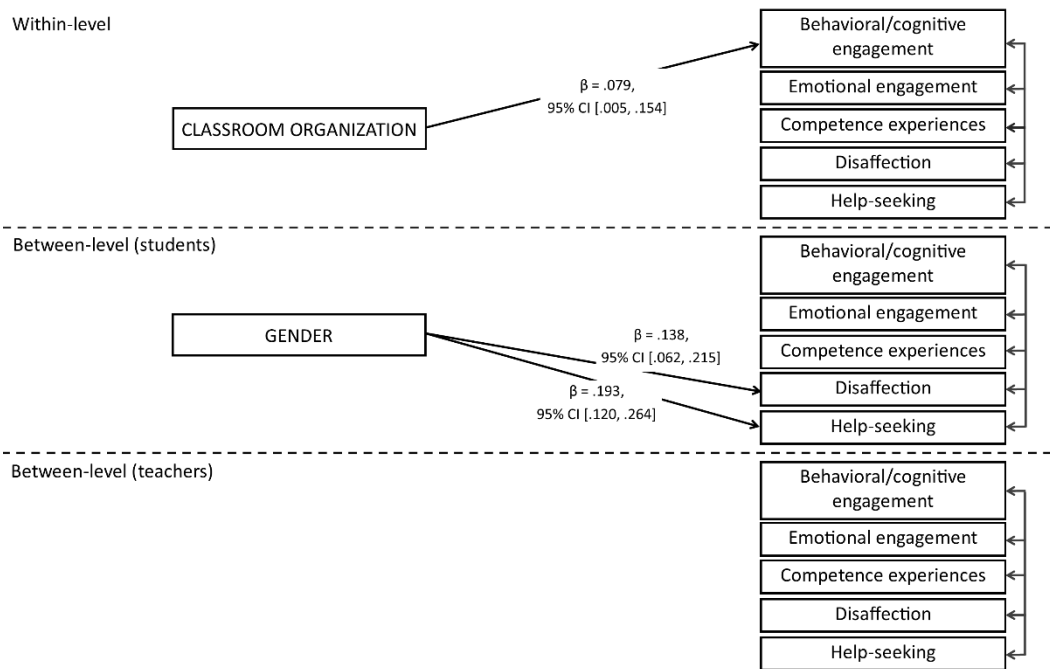


Figure 2. Cross-classified hierarchical model for classroom organization.

Estimates are standardized. Positive values from gender to factors of situation-specific engagement in the between level (students) mean that boys have reported higher values than girls, and negative values mean that boys have reported lower values than girls.

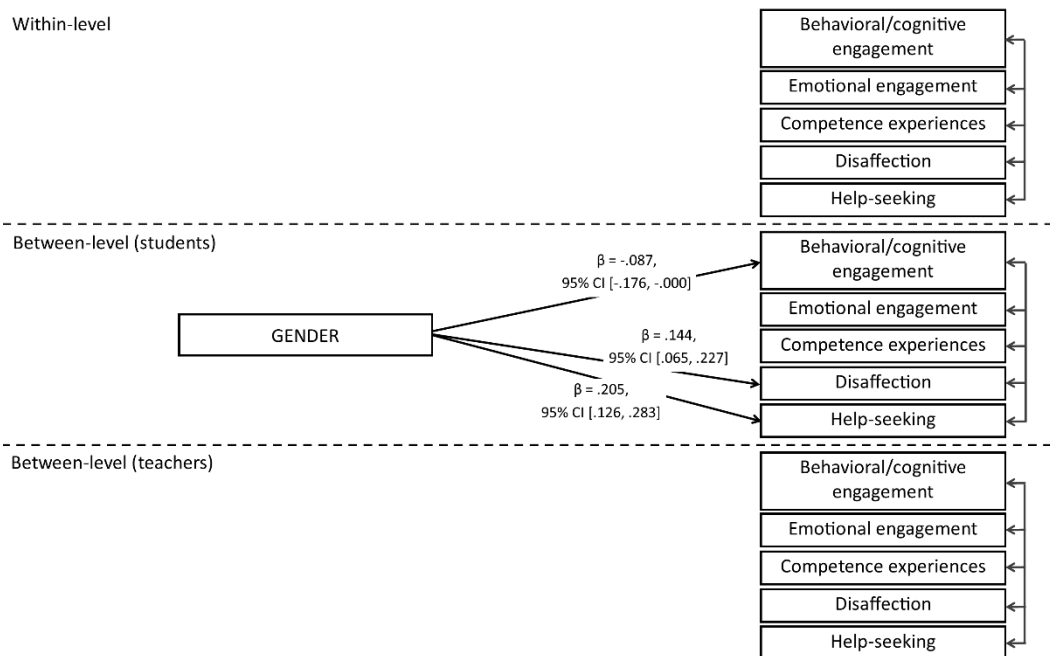


Figure 3. Cross-classified hierarchical model for instructional support.

Estimates are standardized. Positive values from gender to factors of situation-specific engagement in the between level (students) mean that boys have reported higher values than girls, and negative values mean that boys have reported lower values than girls.

Gender as a Predictor and Moderator

Finally, we investigated associations between students' gender and students' situation-specific engagement, as well as whether associations between teacher-student interaction and students' situational engagement differed between boys and girls. The results showed that boys reported significantly higher levels of disaffection and help-seeking than girls (Figures 1, 2, and 3), and girls reported significantly higher behavioral/cognitive engagement than boys (Figure 3). Furthermore, the results showed a statistically significant interaction effect for gender, suggesting that girls benefited more from high emotional support than boys for their situation-specific emotional engagement ($\beta = -.088$, 95% CI [-.161, -.018]).

Discussion

The present study examined associations between teacher-student interaction and lower secondary school students' situational engagement. As the majority of previous studies have focused on overall teacher-student interaction aggregated across different lessons and overall rather than lesson-specific measures of students' academic engagement, the present study is one of the first to investigate the extent to which teacher-student interactions during a particular lesson is associated with students' situation-specific engagement during the same lesson. The data consisted of 155 video-recorded lessons (90 language arts and 65 mathematics lessons) from 59 Grade 7 classrooms, coded using the CLASS-S with respect to classroom interactions and students' ($n = 709$) self-ratings of situational engagement (InSitu). The results showed that the higher the emotional support in the classroom, the higher the students' rated their emotional engagement and help-seeking, and the higher the classroom organization, the higher the students' rated their behavioral/cognitive engagement. The results showed further that girls benefited more from emotional support than boys for their situation-specific emotional engagement.

As expected (Hypothesis 1a), our results showed, first, that emotional support in the classroom was positively related to students' self-rated situation-specific engagement. In lessons where the interactions between teachers and students were rated high for emotional support as assessed by CLASS-S indicators (e.g., capturing an emotional connection, showing warmth, mutual respect between teachers and students, and teachers responding to students' social and emotional needs), students were likely to experience higher emotional engagement and to engage in help-seeking. In line with theoretical assumptions presented in models of student engagement (e.g., Fredricks et al., 2004) and the TTI framework (Pianta, Hamre, & Allen, 2012), the results suggest that emotionally supportive teacher-student interactions in the classroom may affect and promote lower secondary school students' emotional engagement.

The results documenting a positive relation between teachers' emotional support and situation-specific help-seeking is in accordance with prior findings among elementary school students, which indicate that students' tend to be more motivated to ask for guidance and seek help from their teachers in emotionally supportive classrooms

(Marchand & Skinner, 2007). Although the prevailing evidence indicates that during adolescence, students' are typically more reluctant to ask for help and are more inclined to manifest task avoidance behavior (Turner et al., 2002), our results contradict these findings by suggesting that students in Grade 7 respond to emotionally supportive environments similarly as younger students do. Teacher-student interactions that contain high emotional support appear to increase students' willingness to seek help and guidance during the lesson. Overall, our findings corroborate prior findings, highlighting the influential role of an emotionally supportive learning environment in adolescence (e.g., Perry et al., 2010; Skinner & Pitzer, 2012).

Second, as expected (Hypothesis 1b), the results showed that classroom organization, defined in CLASS-S as teacher reinforcement of desirable behavior, managing time effectively, and providing predictable routines (Allen et al., 2013; Hafen et al., 2015), was positively related to students' situation-specific behavioral/cognitive engagement during the same lessons. This finding adds to the prior literature by indicating that classroom organization fosters not only students' general engagement (e.g., Virtanen et al., 2013) but situational engagement as well. However, in contrast to prior literature which found classroom structure to be positively related to all aspects of students' engagement, including emotional engagement (Hospel & Galand, 2016), in the present study, organizational support was not associated with students' situation-specific ratings of emotional engagement, competence experiences, disaffection, and help-seeking. Thus, in the present sample, classroom organization seemed to contribute to behavior/cognitive engagement but not to other dimensions of situational engagement.

Third, contrary to our expectations (Hypothesis 1c), the results did not show a significant relation between class-level instructional support and students' situational engagement. This finding is in line with findings by Rimm-Kaufmann et al. (2015) among primary school students. However, it is in contrast with findings by Virtanen et al. (2013), which showed associations between instructional support and students' general engagement in lower secondary school. One possible explanation for these contradictory findings is that the effects of instructional support may not be evident on situational engagement within particular lessons although they are associated with students' overall (trait-like) sentiments and attitudes towards school. Overall, the results of the present study suggest that in everyday learning situations, students' situational engagement is supported more by emotional support and classroom organization in classroom interactions than by instructional support.

In the present study, we also examined whether teacher-student interactions would have different associations with situation-specific engagement for boys and girls. In order to do that, we first examined differences in students' situation-specific engagement with respect to student gender. Our results were in accordance with findings of previous studies (e.g., Lam et al., 2016), indicating higher situational engagement for girls than for boys. In the present sample, a gender difference was found with regard to boys' higher ratings of disaffection and help-seeking and their lower ratings of behavioral/cognitive engagement. The interaction effect, which was found for gender, indi-

cated that emotional support in the classroom predicted students' emotional engagement differently for girls and boys: girls seemed to benefit more than boys from emotional support in teacher-student interactions with respect to their situational experience of emotional engagement (cf., Roorda et al., 2011; see also Lietaert, Roorda, Laevers, Verchueren, & De Fraine, 2015). The reasons behind this gender difference cannot be inferred based on the present data. However, these results suggest future studies are needed to better understand the ways in which boys' engagement, in particular, could be supported in everyday interactions between teachers and students.

Limitations and Suggestions for Further Research

Some limitations need to be taken into account in generalizing the findings of the present study. First, the results concerning students' situational engagement are based on students' self-ratings. Although students as informants have first-hand experiences and their opinions can be taken at face value, there is an evident need in the future to conduct studies that include situational data consisting of teacher ratings and observed engagement. Second, the current measure of students' situation-specific engagement combined two of the dimensions of engagement into one dimension, namely, behavioral and cognitive engagement. In order to learn more about these two dimensions of engagement, further instruments should optimally distinguish between behavioral and cognitive components of engagement. Third, although no differences were found between the teachers who voluntarily participated in the observations and those who did not participate, it is possible that teachers who chose to participate may differ in ways not studied here. Fourth, teacher-student interactions were here approached using a class-level assessment, which does not take into account that students in a classroom are not necessarily equally affected by teacher practices during lessons (e.g., Cronbach & Snow, 1977; Roorda et al., 2011). Thus, in future studies observations could also utilize measures capturing the individual student's level (e.g., by utilizing InClass; see Downer, Booner, Lima, Luckner, & Pianta, 2010), and by collecting more detailed data from students on their perceived support. Finally, the present study was carried out in one educational context, that of Finnish lower secondary schools, and cultural and educational features need to be taken into account in any generalizations to other contexts.

Conclusions

The present study examined the relation between the of teacher-student interactions in lower secondary school, which were assessed using a widely used observational instrument, CLASS-S, and students' self-ratings of situational engagement at the end of the same lessons. The relevance of this line of research can be justified based on the notion of malleability and situational variability of student engagement (Martin et al., 2015; Pöysä et al., 2017; Vasalampi et al., 2016). Because students' engagement can fluctuate from one lesson to another, each lesson is also a new opportunity for students to become engaged in learning and for teachers to support such engagement. The results of the current study showed that emotional support provided by the teacher and organiza-

tional support provided through effective ways of managing the classroom during lessons were beneficial for students' engagement in the same lessons. The findings highlight the influential role of emotional support on students' experiences of emotional engagement, and the relevance of taking into account the gendered effects of classroom on students' experiences during lessons.

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III

ADOLESCENTS' ENGAGEMENT PROFILES AND THEIR ASSOCIATION WITH ACADEMIC PERFORMANCE AND SITUATIONAL ENGAGEMENT

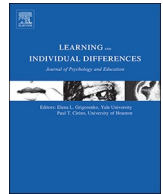
by

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Adolescents' engagement profiles and their association with academic performance and situational engagement

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ABSTRACT

This study examined adolescents' engagement profiles and their association with situational engagement and academic performance in lower secondary school settings. The data consisted of 301 Grade 7 students from Finland. By utilizing person-oriented approach with Latent Profiling Analysis on subscales capturing students' overall engagement, four subgroups of students with different overall engagement profiles were identified. These profile groups were further analyzed with respect to differences in student background (gender and maternal education), academic performance (GPA, and reading and mathematics tests), and lesson-specific situational engagement. The profile groups showed differences with respect to gender, maternal education, and GPAs as well as situational engagement. The findings provided new insights into the associations between overall and situational engagement by documenting concordance but also discordance between them, and by showing situational fluctuation of engagement in particular among students with high overall engagement.

1. Introduction

The predictive association between student engagement and academic learning has been widely acknowledged in the literature (Fredricks et al., 2004; Wang and Eccles, 2011). Nevertheless, prior studies have limitations because they have mostly approached engagement by focusing on students' typical engagement experiences over time (Eccles & Wang, 2012), here termed as overall engagement. While the situational fluctuation of student engagement has been evidenced in prior literature (e.g., Martin et al., 2015), attempts to capture situational variation in students' engagement via repeated measures in authentic learning situations (i.e., situational engagement assessed by self-ratings of students in situ) are still relatively rare. Although prior literature provides some theoretical propositions on how overall and situational engagement are connected (e.g., Lawson & Lawson, 2013), empirical analyses on this relationship are needed. Studies utilizing a person-oriented approach have identified subgroups of students with respect to engagement (Lawson & Masyn, 2015b; Wang & Peck, 2013), but information on situational engagement of students with varying profiles of overall engagement is lacking. This kind of information

would be useful for identifying and supporting students with low engagement, and for providing teachers' insight into their students' situational engagement in the classroom and from lesson to lesson. In order to bridge the gap between the two separate strands of engagement literature, the present study set out to examine and increase understanding on the association between overall and situational engagement. A person-oriented approach is utilized to identify subgroups of students with similar patterns of overall engagement, and these subgroups are subsequently analyzed with respect to their situational engagement, academic performance and background factors.

1.1. Student engagement

Student engagement is a multidimensional construct that combines different aspects related to students' commitment and involvement with school and learning (e.g., Appleton et al., 2008). According to the widely acknowledged conceptualization by Fredricks et al. (2004) student engagement consists of three distinct, yet interrelated, components: behavioral engagement, emotional engagement, and cognitive engagement (see also Fredricks, Ye, et al., 2019; Wang et al., 2011). In

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the literature, the term *behavioral engagement* is typically used to refer to students' active involvement and effort focused on learning and academic tasks, positive conduct (e.g., completing assignments and preparing for classes), and participation in extracurricular activities (Fredricks et al., 2004; Wang et al., 2011). *Emotional engagement* is seen to encompass students' sentiments toward school and learning, and a sense of belonging with respect to school and its people (e.g., Appleton et al., 2006; Fredricks et al., 2004). *Cognitive engagement* captures students' cognitive investment in learning and schooling. Drawing from two somewhat distinct lines of literature, it focuses both on self-regulated strategies, which students use to master knowledge or skills, and on the value they place for schoolwork and its importance for their future (e.g., Appleton et al., 2008; Fredricks et al., 2004).

While the tripartite conceptualization presented above continues to be the most prevalent definition for the construct of student engagement (Fredricks, Reschly, & Christenson, 2019), also additional components, such as social engagement (Fredricks, Wang, et al., 2016) or agentic engagement (Reeve, 2013) have more recently been introduced into the conceptualization of student engagement. These somewhat varying definitions of what constitutes the core of student engagement can be considered to reflect the evolving nature of the field. In the similar vein, boundaries between dimensions of engagement are not necessarily clear cut for interlinking constructs as, for example, student effort can be seen to function as an indicator of behavioral as well as cognitive engagement (e.g., Fredricks, Filsecker, & Lawson, 2016). In addition, an agreement is yet to be reached on whether indicators and facilitators of engagement (the latter construed, e.g., as competence experiences) should be distinguished and treated as separate to engagement (see e.g., Fredricks, Reschly, & Christenson, 2019). Another example of the continual evolution in the field is the conceptualization of the construct of disengagement, which first was construed as the absence of engagement, but has lately been viewed as an independent concept including maladaptive behaviors and emotions that cannot be explained always as low engagement (Fredricks, Ye, et al., 2019; Lawson, 2017; Skinner et al., 2009).

Despite of the differences in definitions and point of views among scholars, there is a wide agreement that engagement is a multi-dimensional construct, which critically adds to understanding of the whole of student behaviors, feelings, and cognitions within learning-related contexts. Engagement is also recognized as being malleable, which means that it is responsive to external support, and, therefore, it may be accommodated via interventions (Lawson & Lawson, 2013; Wang, Decol, & Henry, 2019).

1.2. Overall and situational engagement

The present study is founded on the stance that student engagement needs to be approached on two levels: via students' self-reports of their behaviors, emotions, and cognitions captured in situ in actual learning-related situations (i.e., situational engagement) as well as via students' self-appraisals of their typical engagement with school and learning over time (i.e., overall engagement). The vast majority of prior studies have approached engagement by using measures that aggregate information across time from different situations and time points, and by aiming to capture students' average experiences (Eccles & Wang, 2012). These studies have provided valuable knowledge on the association between engagement and academic performance (e.g., Ladd & Dinella, 2009; Wang & Holcombe, 2010), and documented change in engagement longitudinally over time (Archambault et al., 2009). They have also provided information on the role that student characteristics play in engagement by documenting lower engagement among boys than girls (e.g., Lam et al., 2016), and by indicating that family's low socioeconomic status may pose a risk for lower engagement (Li & Lerner, 2011; Linnankylä & Malin, 2008). In addition, they have increased our understanding on how engagement is not uniformly formed, but instead sub-populations with several different engagement dispositions can

actually be recognized among students (Lawson, 2017; Lawson & Masyn, 2015a, 2015b). However, when engagement is approached at its overall level, situation-specific variations in students' learning-related experiences are not acknowledged and captured (cf. Eccles & Wang, 2012). Thus, knowledge on student engagement that can be gained by focusing on such variations is needed to move the field forward.

While only limited number of studies have focused on situational engagement with repeated assessments capturing students' experiences in authentic learning situations, those have consistently documented intra-individual variations in students' situational engagement (Martin et al., 2015; Pöysä et al., 2018; Vasalampi et al., 2016). These studies have also begun to accumulate evidence on factors that may have an influence on fluctuation in situational engagement. Recent studies have shown, for example, that situational engagement is higher in lessons of non-academic subjects than in academic subjects (Pöysä et al., 2018; Shernoff et al., 2003), and that situational engagement is associated with emotional support in teacher–student interactions during the lesson (Pöysä et al., 2018). Thus, engagement is not only malleable over time, but fluctuates from one learning situation to another as well. Nevertheless, studies capturing both overall and situational engagement simultaneously are scarce, and investigations that would provide empirical evidence on the relations between the two, are still needed.

Despite the yet limited body of empirical findings on the relations between overall and situational engagement, assumptions about the conceptual link have been put forward in previous literature. In their prominent review of student engagement research and theory Lawson and Lawson (2013) laid out a persuasive framework according to which students' various acts of engagement that occur at particular moments in time (i.e., at the situational level), stem from students' prior dispositions of engagement as well as changing external conditions (see also Lawson, 2017). This notion of engagement dispositions does not, however, imply that these dispositions should be seen as inherently stable or deterministic (Lawson & Lawson, 2013). Rather, engagement dispositions are malleable and, they can, therefore, be molded, for example, by experiences gained at particular moments in time (Lawson & Lawson, 2013). Aligning with this proposition, the present study advocates the view that overall engagement (cf. engagement dispositions) and situational engagement (cf. acts of engagement) are transactionally related. Investigating the two constructs simultaneously can throw light, first, on whether the relation would be similar for students with different levels of overall engagement, and second, what kind of factors are associated with shaping of students' engagement.

In the present study, the tripartite definition of student engagement formed the basis for assessment at both overall and situational level, but some differences were inevitable with respect to operationalizations. First, when assessing students' overall engagement, the dimensions of behavioral, emotional, and cognitive engagement were retained as independent from one another (Appleton et al., 2006; Wellborn & Connell, 1987) whereas with respect to situational engagement, behavioral and cognitive engagement showed substantial association in the students' self-ratings (e.g., attending to a task, sustained cognitive problem solving and aim for mastery are likely to be highly linked), which is why in effect they were merged (see Vasalampi et al., 2016). Second, situationally bound facilitators (i.e., students' competence experiences and help-seeking) were included in self-ratings at situational level while those were not separately assessed at overall level. The theoretical rationale for including competence experiences as situational facilitators draws from the self-system motivational model (Connell & Wellborn, 1991). Help-seeking, in turn, was conceptualized as a facilitator of re-engagement in interaction and learning tasks during the lesson (Marchand & Skinner, 2007). Finally, at the situational level, disengagement was seen as a relevant aspect of learning situations and in line with prior literature (cf. Skinner et al., 2009) the term disaffection was used and defined as maladaptive behaviors and emotions occurring within the lesson.

1.3. Person-oriented approach to assessment of student engagement

Previous studies examining student engagement have largely been conducted using traditional variable-oriented designs, which focus on universal and linear associations between variables in a particular sample (see Bergman & Andersson, 2010). While such studies provide important insights into student engagement, they do not consider the potential of subgroups of individuals with different profiles or patterns of engagement. Thus, variable-oriented designs are likely to tap into the average student but may remain silent on actual individuals (Bergman & Trost, 2006; Fredricks, Ye, et al., 2019; Lawson & Masyn, 2015a). By focusing on patterns of similarities and differences within the measured indicators, person-oriented approach can provide novel insights on subgroups of individuals who engage in different ways (Bergman & Trost, 2006; Eccles, 2016; Lawson & Lawson, 2013). For example, by revealing different engagement dispositions with person-oriented approach, Lawson and Masyn (2015b) were able further analyse the differences these subgroups had in their educational attainment outcomes. In the present study, person-oriented approach was used for its potential for bringing light to fluctuations of situational engagement which may be different for different subgroups of students and have different associations with individual factors (gender and maternal education), and academic performance factors.

As conceptualizations and operationalizations of engagement are not uniform in research field, the prior engagement literature that utilizes a person-oriented approach show a broad diversity. Some studies, such as that by Wang and Peck (2013), have identified subgroups with different profiles of engagement using all three dimensions of engagement (i.e., behavioral, emotional, and cognitive) simultaneously, but some studies have focused only on some specific dimensions (e.g., Li & Lerner, 2011). The number of identified subgroups also differs, and sometimes only three patterns of engagement have been identified (e.g., Watt et al., 2017) whereas in some studies, the number of identified subgroups have been higher, for example six, or seven (e.g., Lawson & Masyn, 2015b; Archambault et al., 2009, respectively). Nevertheless, studies utilizing person-oriented approach to examine engagement through repeated ratings of situational engagement are exceptionally rare (for an exception, see e.g., Schmidt et al., 2017). However, despite of diversity in the used variables and the number of identified subgroups, the prior findings can be seen to lead into a conclusion that more advanced knowledge of engagement can only be achieved by paying attention to within-group variations and to profiles of individuals who are engaged in different ways (e.g., Lawson & Masyn, 2015b; Schmidt et al., 2017). Such knowledge would critically enhance understanding on the role that engagement has in learning processes, and help to devise tools, tailored interventions, and guidelines for practitioners to support students in day-to-day practice (cf. Lawson, 2017).

1.4. The present study

The present study was set to reach a more comprehensive understanding of students' overall and situational engagement in lower secondary school settings. While evidence has accumulated on student engagement in general, studies assessing engagement with repeated measures at the situational level in contextually bound learning situations are much more rare (Eccles & Wang, 2012). To our knowledge hardly any studies have set out examine overall as well as situational engagement simultaneously in order gain insight on variation of situational engagement in different subgroups of students. Although the present data and measures partly overlap with prior studies of the authors on intra-individual situational variation in students' engagement, and correlations between overall and situational engagement (Pöysä et al., 2018, 2019; Vasalampi et al., 2016), the present study adds a unique contribution by utilizing the person-oriented approach for examining students' overall and situational engagement. The following

research questions were set:

1. What kind of subgroups of overall engagement can be identified among Grade 7 students? Based on previous findings showing that engagement may vary among different subgroups of students (e.g., Lawson & Masyn, 2015b; Watt et al., 2017), it was expected (Hypothesis 1) that several distinct subgroups would be identified.
2. To what extent do the identified subgroups differ in a) students' background factors (gender and maternal education), and b) academic performance (GPAs, and tests in reading and mathematics)? First, in line with earlier literature indicating higher engagement for girls than for boys (e.g., Lam et al., 2016), and lower engagement for students from family's with lower socioeconomic statuses (e.g., Linnankylä & Malin, 2008), it was expected that subgroups would differ based on the distribution of students' background factors (Hypothesis 2a). Second, based on previous findings (e.g., Ladd & Dinella, 2009), it was expected that subgroups with higher overall engagement would manifest higher academic performance, whereas subgroups with lower engagement would manifest lower academic performance (Hypothesis 2b).
3. To what extent do the identified subgroups differ in a) mean levels of situational engagement (behavioral/cognitive engagement, emotional engagement, disaffection, competence experiences, and help-seeking), and b) variation of situational engagement across lessons? As prior literature provides theoretical propositions on links between overall and situational engagement (Lawson & Lawson, 2013), it was expected (Hypothesis 3) that subgroups would differ on mean levels of students' situational engagement. Due to the lack of prior studies, no hypothesis was set for variation in situational engagement by subgroup (RQ 3b).

2. Method

2.1. Participants and procedure

The sample consisted of 301 Grade 7 students (49.8% girls; $M_{age} = 13.7$ years) from 18 Finnish-speaking lower secondary schools. The data were collected during spring term of 2014. Each participant completed, first, group-administrated questionnaires regarding their overall engagement and tests assessing their academic performance. Second, participants provided data regarding their situational engagement at the end of at least three independent lessons.

The present study was conducted as part of an extensive longitudinal age cohort study, which investigated students' motivational and academic development throughout their comprehensive education during years 2006–2016. Altogether, the First Steps study (Lerikkanen et al., 2006–2016) comprised approximately 2000 students along with their guardians and teachers from four municipalities located in different parts of Finland. In spring 2014, 1809 students participated into group-administrated questionnaires and tests, and close to half of them (884 students; 48.9% of the total sample) were asked to provide at least one assessment of their situational engagement as well. The students' guardians had provided written consent for their child's participation in the study, and all participants have been treated according to APA ethical guidelines. A statement of ethics approval for the study was granted by the University of Jyväskylä's Committee of Ethics.

Guided by the aim of examining intra-individual variation in situational engagement across lessons, the present study utilized data collected only from students who had provided at least three end of the lesson assessments of situational engagement using the InSitu instrument. Therefore, students with only one or two assessments of situational engagement (i.e., 583 students of those 884 who had provided situational assessments) were excluded from the present data set. No statistical differences were found in overall engagement nor academic performance between students in the present subsample (301 students) and the rest of the students participating in the follow-up assessments in

spring 2014 (1508 students).

The students' ratings of situational engagement for the present analyses were drawn from lessons from different academic subjects. Due to unavoidable limits in resources for collecting situational assessments, the number of opportunities that students had for providing ratings of situational engagement differed between participating schools, and ranged between 3 and 23 ($M = 6.24$ ratings/student, $SD = 5.60$). More specifically, approximately 80% of the 301 participants attended schools where the assessment protocol included 3 to 6 opportunities (i.e., lessons) for students to participate in assessment of situational engagement, and approximately 20% of the participants attended schools where the assessment protocol provided 18 to 23 opportunities. In the latter case, the students attended schools where the majority of all teachers allowed the InSitu assessments at the end of all their lessons within a school week. Response rate, counted by acknowledging the number of opportunities that each student had to make situational assessments, was 92.8%. The data contained a total of 1879 self-ratings of situational engagement: 545 ratings were from language arts lessons, 396 from mathematics lessons, 298 from foreign languages lessons (i.e., English and Swedish), 323 from science lessons (e.g., biology and physics), and 317 from lessons from other academic subjects (e.g., history and health education).

The sample was representative of the Finnish population (Statistics in Finland, 2018) with respect to the distribution of maternal education. In the current sample, 4.3% of the students' mothers had a low educational level (i.e., no vocational degree), 65.2% had an intermediate educational level (i.e., vocational school degree, vocational college degree, or bachelor's degree), and 30.5% had a high educational level (i.e., master's, licentiate's, or doctor's degree).

2.2. Measures

2.2.1. Overall engagement

The three dimensions of engagement (i.e., behavioral, emotional, and cognitive) were assessed at the overall level by using two self-rating measures: the Student Engagement Instrument (SEI; Appleton et al., 2006; Finnish short version SEI-F; Virtanen et al., 2016) and the middle school student version of the Rochester Assessment Package for Schools (RAPS; Wellborn & Connell, 1987). The SEI-F consists of 18 items rated on a four-point Likert scale (1 = *completely disagree*; 4 = *completely agree*). The SEI-F captures two types of cognitive engagement with subscales of *control and relevance of schoolwork* (6 items, $\alpha = 0.82$; e.g., "When I do schoolwork, I check to see whether I understand what I'm doing"), and *future aspirations and goals* (3 items, $\alpha = 0.87$; e.g., "Going to school after secondary school is important"). Emotional engagement is assessed with three subscales: *teacher-student relationship* (3 items, $\alpha = 0.89$; e.g., "At my school, teachers care about students"), *peer support in learning* (3 items, $\alpha = 0.84$; e.g., "Other students at school care about me"), and *family support in learning* (3 items, $\alpha = 0.82$; e.g., "When I have problems at school, my guardian is willing to help me") (see Appleton et al., 2006; Betts, 2012). These five subscales of SEI-F capture both cognitively framed indicators of engagement (e.g., striving for cognitive mastery and having favorable aspirations) and indicators of emotional engagement (i.e., sense of belonging and having access to relationships, which they perceive caring, and encouraging regarding their school work). Composite mean scores were calculated for each of the five subscales.

The RAPS Scale (drawn from the Rochester Assessment Package for Schools; Wellborn & Connell, 1987) consists of five items assessing students' behavioral engagement, and it was used to capture the third dimension included in the tripartite definition of student engagement. Items (e.g., I work very hard on my schoolwork, $\alpha = 0.79$) were rated on a four-point scale (1 = *strongly disagree*; 4 = *strongly agree*), and a composite mean score was calculated.

2.2.2. Student characteristics and contextual factor

Variables representing student characteristics included *gender* (1 = girl; 2 = boy) and *maternal education* (1 = low educational level, i.e., no vocational degree; 2 = intermediate educational level, i.e., vocational school degree, vocational college degree, or bachelor's degree; 3 = high educational level, i.e., master's, licentiate's, or doctor's degree).

Students' *home group* variable contains membership information on each student's stable group in which lower secondary school students study the vast majority of their lessons. In Finland, students are assigned into these heterogeneous home groups at the beginning of lower secondary school.

2.2.3. Academic performance

2.2.3.1. Academic achievement. Students' academic GPAs were collected from official school records provided by each school's administrative staff at the end of Grade 7. Grading from 4 (*fail*) to 10 (*excellent*) is guided by the national curriculum (providing criteria for passing grade-level learning goals). Mean grade of academic subjects was calculated and used as GPA.

2.2.3.2. Reading comprehension. The group-administered reading comprehension task was part of a reading test battery (YKÄ; Lerkkanen et al., 2018) with national norms. In the task, students read silently an expository text and answered 12 questions based on its content (11 multiple-choice questions and one requiring re-arranging statements into the correct sequence). Students completed the task at their own pace, but the maximum time allotted was 45 min. For each correct answer, one point was given, producing a maximum score of 12 (Kuder-Richardson reliability = 0.68).

2.2.3.3. Reading fluency. A group-administered speeded task belonging to a reading test battery (YKÄ; Lerkkanen et al., 2018) with national norms was used to assess reading fluency. It consisted of 80 items each with a picture and four phonologically similar words attached to it. The students silently read the four words and then drew a line connecting the picture with the word. The score was the number of correct answers within a two-minute time limit (Kuder-Richardson reliability = 0.85).

2.2.3.4. Arithmetic fluency. Arithmetic fluency was assessed using a group-administered test (Aunola & Räsänen, 2007). It included 28 items containing addition, subtraction, multiplication, and division problems. The task difficulty increases across the test. The score was the number of correct answers within a three-minute time limit (Kuder-Richardson reliability = 0.74).

2.2.4. Situational engagement

Students' situational engagement was measured with the In Situations (InSitu) Instrument (Lerkkanen, Vasalampi & Nurmi, 2013; Vasalampi et al., 2016), using smart phones handed to the students immediately at the end of the classroom lesson. InSitu consists of 17 items rated on a five-point scale (1 = *not at all*; 5 = *very much*). InSitu assesses both the key indicators comprising the tripartite conceptualization of student engagement (Fredricks et al., 2004; Wang et al., 2011), and two types of facilitators of engagement. The indicators are assessed using the following three subscales: *behavioral/cognitive engagement* (7 items, $\alpha = 0.82$; e.g., "How persistent were you in studying during the lesson?", "How important did you find the studied content?"); *emotional engagement* (3 items, $\alpha = 0.86$; e.g., "How much did you like the lesson?"); and *disaffection* (3 items, $\alpha = 0.68$; e.g., "How boring was the lesson?"). Behavioral and cognitive engagement were intended as separated subscales (i.e., separate scales with respective items were originally created), but as prior explorative and confirmatory factor analyses (Vasalampi et al., 2016) indicated high correlations between behavioral and cognitive engagement in

approaching tasks in authentic learning situations, these two dimensions were merged into one subscale at the situational level. The third indicator, disaffection, focused on the maladaptive behaviors and emotions occurring within the lesson at hand (cf. Skinner et al., 2009). The two subscales representing facilitators of student engagement assessed by InSitu consist of the following: *competence experiences* (2 items, $\alpha = 0.78$; “How easy was the lesson for you?”); and *help-seeking* (2 items, $\alpha = 0.79$; e.g., “How much did you ask for help from the teacher/another adult during the lesson?”). Competence experiences were seen as a situational facilitator allowing a student to engage in learning of engagement (cf. Connell & Wellborn, 1991) and help-seeking as a facilitator for becoming re-engaged (cf. Marchand & Skinner, 2007).

2.3. Analytical strategy

2.3.1. Descriptive analyses

Due to the hierarchical structure of the data comprising students nested in classrooms, intraclass coefficients (ICCs) were calculated to determine the proportion of variances at the classroom and individual levels. As ICCs between classrooms were small (ranging between 0.001 and 0.022), subsequent analyses for the identified subgroups were executed without applying a multilevel approach. Preliminary analyses calculation of descriptive statistics, independent samples *t*-tests to test for gender differences in overall engagement.

2.3.2. Latent profile analysis

Next, a person-oriented approach with latent profile analysis (LPA, Vermunt & Magidson, 2002) was used to identify subgroups of students with similar patterns of overall engagement. LPA is model-based variant of traditional cluster analysis in which the goal is to identify the smallest number of latent classes that adequately describe the associations among the observed continuous variables (Nylund-Gibson & Masyn, 2016; Vermunt & Magidson, 2002). By providing fit indices, it enables comparisons between a different number of classes and the number of underlying classes.

Within this study the enumeration process was conducted by utilizing log-likelihood (log L), Bayesian information criterion (BIC), adjusted Bayesian information criterion (ABIC), Akaike information criterion (AIC), and Vuong-Lo-Mendell-Rubin (VLMR) and adjusted Lo-Mendell-Rubin (LMR) likelihood ratio tests as well as theoretical and practical consideration. The model with the lowest log L, BIC, ABIC, and AIC values is considered to provide a good fit to the data, and $p > .05$ with VLMR and LMR indicates that the model with one less class should be rejected in favor of the estimated model (Lo et al., 2001). Theoretical and practical consideration focuses on usefulness and model interpretability, and for example profile solutions with one or several subgroups with approximately 1% of participants or less are discarded because they do not allow statistical power for subsequent analyses.

The LPAs were conducted using the Mplus statistical package (versions 7.4 and 8.4; Muthén and Muthén, 1998-2017) with students' home group as the clustering variable. LPAs were carried out by utilizing the COMPLEX option in order to adjust for the standard errors due to nesting. During the enumeration process, profiles were specified in the following ways, first, by letting means vary between classes and setting variances to be equal between classes, second, by estimating averages for each classes with variances and covariances set as equal, and, third, by estimating averages, variances and covariances separately for each class. The model resulting from the first specification of parameters was chosen as it provided the best fit with the data. Next, Wald tests of parameter constraints and pairwise comparisons were run in Mplus by using three-step approach to validate the profiles by comparing them in terms of the criterion variables (cf. Asparouhov & Muthén, 2014).

2.3.3. Comparison of subgroups

As the third phase of the analysis, the identified subgroups (based on patterns of overall engagement) were compared in terms of students' background factors, academic performance, and situational engagement. Analyses comparing the subgroups on students' background (gender and maternal educational level, RQ 2a) and academic performance (GPA, reading fluency, reading comprehension, and arithmetic fluency, RQ 2b) were carried using multinomial regression analyses and pairwise comparisons using the Auxiliary function and the three-step procedure. Analyses concerning students' situational engagement were carried out with multilevel models using Wald tests to assess parameter constraints. The parameters of the models were estimated using robust maximum likelihood (MLR) as an estimator. All models were composed with two levels where the first level represented *within level* (modelling variation within individuals), and the second level represented *between level* (modelling variation between individuals), where variance tests and pairwise comparisons were utilized. A two-level multinomial regression analysis that included all five dimensions of situational engagement (i.e., behavioral/cognitive engagement, emotional engagement, disaffection, competence experiences, and help-seeking) was conducted (RQ 3a) to test the extent to which the identified subgroups (i.e., subgroup membership) predicted the individual mean level of students' situational engagement (i.e., individuals' mean level of InSitu ratings in each dimension averaged across lessons). A series of two-level multinomial regression analyses were conducted separately for the five dimensions of situational engagement in order to test the extent to which subgroup membership predicted the variations of situational engagement (RQ 3b).

3. Results

3.1. Descriptive statistics

Descriptive statistics for students' overall engagement, academic performance, and situational engagement as well as findings of comparisons between girls and boys using independent *t*-tests are shown in Table 1. Significant gender differences were found in four comparisons. Girls reported significantly higher overall behavioral engagement ($t(299) = 3.07, p = .002$) than boys. Girls also had higher scores than boys in reading comprehension ($t(299) = 4.08, p < .001$) and reading fluency ($t(299) = 3.40, p < .001$), but no differences were found for arithmetic fluency or GPA. In situational engagement, girls reported significantly lower disaffection ($t(299) = -3.77, p < .001$) than boys, but no other gender differences were found in situational engagement.

3.2. Profile groups based on overall engagement

LPAs were conducted to identify subgroups based on the five composite scores of overall engagement (RQ1). The results from the series of LPAs are presented in Table 2. Based on the values of log L, BIC, ABIC, and AIC, the seven-group solution would have provided a good fit to the data (in particular based on elbowing of BIC). However, in the five-, six- and seven-group solutions the smallest group had less than 4 members, which would have prevented subsequent statistical analyses. Based on this practical reason, and because of its best VLMR and LMR values, the four-group solution was determined to provide the most optimal fit with the data.

In the four-group solution, three of the groups showed concordant patterns across the subscales used to capture students' behavioral, emotional, and cognitive engagement (Fig. 1). The first profile, *High-Overall-Engagement (High-OE)*, included 89 students; the second profile, *Low-Overall-Engagement (Low-OE)*, included 14 students; and the third profile, *Mid-Overall-Engagement (Mid-OE)*, included 114 students. The fourth profile was similar to the Mid-OE profile except for high values in Future aspirations and goals. The fourth profile, named *Mid-Overall-Engagement-with-High-Future-Goals (Mid-OE + High-FG)*, included 84

Table 1
Descriptive statistics.

	Total <i>M</i> (<i>SD</i>) <i>N</i> = 301	Girls <i>M</i> (<i>SD</i>) <i>n</i> = 155	Boys <i>M</i> (<i>SD</i>) <i>n</i> = 146	t-test
Overall engagement				
Control and relevance of schoolwork (SEI–F, Cog.)	3.05 (0.47)	3.06 (0.44)	3.05 (0.50)	ns
Future aspirations and goals (SEI–F, Cog.)	3.52 (0.52)	3.63 (0.43)	3.41 (0.57)	ns
Teacher–student relationship (SEI–F, Em.)	3.01 (0.64)	3.02 (0.63)	3.00 (0.65)	ns
Peer support in learning (SEI–F, Em.)	3.05 (0.59)	3.06 (0.64)	3.03 (0.52)	ns
Family support in learning (SEI–F, Em.)	3.47 (0.52)	3.52 (0.52)	3.42 (0.52)	ns
Behavioral engagement (RAPS)	3.16 (0.49)	3.25 (0.45)	3.07 (0.52)	3.07**
Academic performance				
GPA of academic subjects	8.03 (0.99)	8.30 (0.87)	7.74 (1.03)	ns
Reading fluency	37.09 (8.23)	38.63 (7.68)	35.45 (8.50)	3.40***
Reading comprehension	6.39 (2.56)	6.96 (2.50)	5.79 (2.50)	4.08***
Arithmetic fluency	13.44 (3.73)	13.10 (4.29)	13.79 (4.29)	ns
Situational engagement				
Behavioral/cognitive engagement (InSitu)	3.15 (0.73)	3.20 (0.74)	3.11 (0.71)	ns
Emotional engagement (InSitu)	3.10 (0.78)	3.12 (0.94)	3.08 (0.84)	ns
Disaffection (InSitu)	2.31 (0.83)	2.15 (0.79)	2.45 (0.84)	–3.77***
Competence experiences (InSitu)	3.54 (0.86)	3.60 (0.89)	3.49 (0.83)	ns
Help-seeking (InSitu)	1.96 (0.89)	1.71 (0.76)	2.20 (0.95)	ns

Note. Overall engagement: 1 = *completely disagree* to 4 = *completely agree*, Cog. = Cognitive engagement, Em. = Emotional engagement; GPA: 4 = *failed* to 10 = *excellent*; Situational engagement: 1 = *not at all* to 5 = *very much*. Number of InSitu ratings: total *N* = 1879, girls *n* = 900, and boys *n* = 979.
ns = non-significant.

*** $p < .001$.

** $p < .01$.

students. The four-group solution was validated with Wald tests of parameter constrain and paired comparisons, which showed that the groups differed from each other on the criterion variables on which the LPAs were based (Table 3). Students' response rates on InSitu assessment did not show any differences between the students in the four profile groups ($F_{3,298} = 0.684$, $p = .562$).

3.3. Differences in student background factors and academic performance between profile groups

Next, analyses were conducted to examine the extent to which the identified profile groups differed in students' background factors (gender and maternal educational level; RQ 2a) and academic performance (GPA, reading fluency, reading comprehension, and arithmetic fluency; RQ 2b).

The results of multinomial regression analysis and pairwise comparisons suggested some differences between profile groups with respect to students' background factors. The proportion of boys was higher in the Low-OE profile than in the Mid-OE + High-FG and High-OE profile groups ($\beta = -2.89$, $p = .015$; $\beta = -2.75$, $p = .018$, respectively). Furthermore, the results indicated that maternal educational level was significantly higher in the Mid-OE + High-FG profile group than in the Mid-OE profile group ($\beta = 0.67$, $p = .035$).

The results of multinomial regression model and pairwise comparisons for students' academic performance suggested that the four profile groups differed with respect to GPAs, but not in reading comprehension, reading fluency, or arithmetic fluency. Statistically significant

differences in GPA were found between each profile group (Table 4). The three profile groups showing concordant patterns across the five dimensions of overall engagement (High-OE, Low-OE, and Mid-OE) demonstrated corresponding levels of high, low, and mid GPAs (e.g., students in the High-OE group had the highest mean level of GPA). In the fourth profile group, Mid-OE + High-FG, the average GPA was second highest, after the High-OE profile group, but no statistical differences were found on GPAs between High-OE and Mid-OE + High-FG profile groups.

3.4. Comparison of latent profile groups with respect to students' situational engagement

Final step of the analysis was to determine the extent to which the identified profile groups differed in the students' individual mean levels of situational engagement (RQ 3a) and in variation of situational engagement across lessons (RQ 3b).

3.4.1. Comparison of individual mean levels of situational engagement

The two-level model examining the extent to which the profile groups differed in variation of the students' individual mean levels of situational engagement across the lessons was saturated. Wald tests of parameter constraints were significant, suggesting significant differences between the profile groups in all five components of situational engagement, behavioral/cognitive engagement, emotional engagement, disaffection, competence experiences, and help-seeking, respectively (Wald's $\chi^2(3) = 96.81$, $p < .001$; Wald's $\chi^2(3) = 56.05$,

Table 2
Fit indices for the series of latent profile analyses (LPAs).

Number of classes	log L	BIC	ABIC	AIC	VLMR	LMR	n	n	n	n	n	n	n	n
1	–1428.43	2925.43	2887.37	2880.87			301							
2	–1214.14	2536.83	2476.58	2466.27	0.001	0.001	147	154						
3	–1165.42	2479.40	2396.94	2382.84	0.476	0.485	18	129	154					
4	–1098.29	2385.13	2280.47	2262.57	0.054	0.056	14	84	114	89				
5	–1066.55	2361.65	2234.80	2213.11	0.351	0.357	25	101	85	2	88			
6	–1035.84	2340.23	2191.17	2165.69	0.337	0.343	2	76	40	12	85	87		
7	–862.84	2034.23	1862.97	1833.69	0.482	0.486	78	4	16	73	37	61	32	
8	–979.95	2308.44	2114.98	2081.90	0.236	0.235	10	3	3	35	60	79	45	64

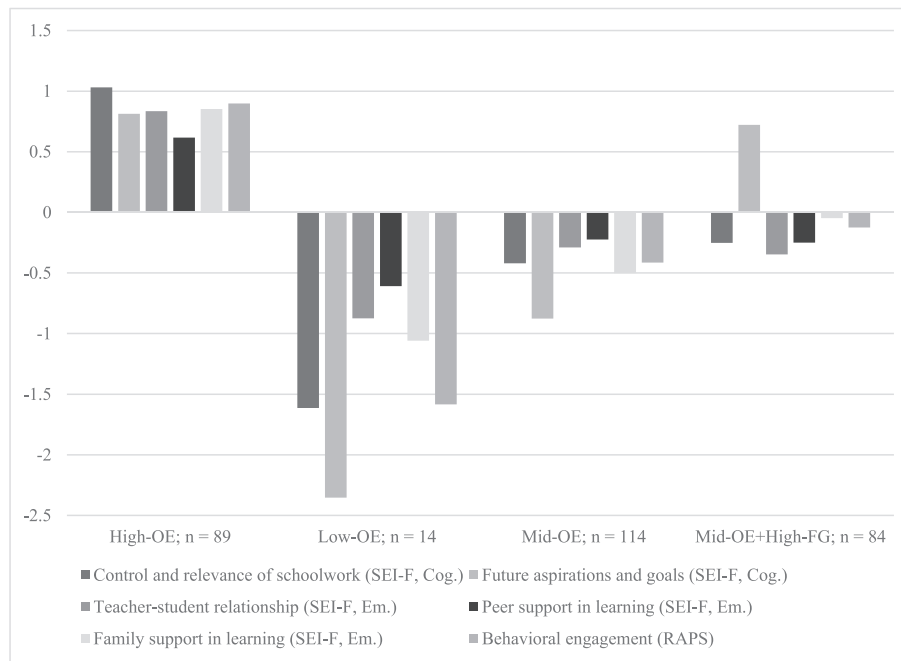


Fig. 1. Patterns of overall engagement in four profile groups.

Table 3

Mean differences in overall engagement between the profile groups.

Composite scores of overall engagement	1 High-OE (n = 89)	2 Low-OE (n = 14)	3 Mid-OE (n = 114)	4 Mid-OE + High-FG (n = 84)	Wald test	Pairwise comparisons
	M(SD)	M(SD)	M(SD)	M(SD)	$\chi^2(3)$	
Control and relevance of schoolwork (SEI-F, Cog.)	3.53 (0.31)	2.29 (0.56)	2.85 (0.32)	2.94 (0.30)	203.10 ***	1 > 2, 3, 4 / 2 < 3, 4
Future aspirations and goals (SEI-F, Cog.)	3.94 (0.52)	2.31 (0.31)	3.07 (0.18)	3.90 (0.15)	1474.68 ***	1 > 2, 3 / 2 < 4 / 3 < 4
Teacher-student relationship (SEI-F, Em.)	3.84 (0.47)	2.45 (0.72)	2.82 (0.54)	2.77 (0.53)	78.18 ***	1 > 2, 3, 4
Peer support in learning (SEI-F, Em.)	3.41 (0.56)	2.69 (0.56)	2.92 (0.45)	2.89 (0.61)	47.40 ***	1 > 2, 3, 4
Family support in learning (SEI-F, Em.)	3.91 (0.20)	2.92 (0.63)	3.21 (0.45)	3.45 (0.49)	177.28 ***	1 > 2, 3, 4 / 2 < 4 ¹ / 3 < 4 ¹
Behavioral engagement (RAPS)	3.60 (0.30)	2.38 (0.50)	2.96 (0.39)	3.12 (0.35)	239.28 ***	1 > 2, 3, 4 / 2 < 3, 4

Note. Overall engagement: 1 = *completely disagree* to 4 = *completely agree*, Cog. = Cognitive engagement, Em. = Emotional engagement; Pairwise comparisons reported between groups in which differences are statistically significant with $p < .001$, except for ¹ at $p < .01$.

*** $p < .001$.

Table 4

Mean levels of GPAs and estimates of paired comparison analyses between the profile groups.

	M(SD)	Estimates based on paired group comparisons		
		Low-OE	Mid-OE	Mid-OE + High-FG
High-OE (n = 89)	8.50 (0.91)	-2.45 ***	-1.28 ***	ns
Low-OE (n = 14)	6.84 (0.70)		1.17 *	1.98 ***
Mid-OE (n = 114)	7.64 (0.93)			0.81 ***
Mid-OE + High-FG (n = 84)	8.26 (0.85)			

Note. Means represent average values for profile groups calculated by utilizing students' individual mean GPAs with 4 = *failed* to 10 = *excellent*.

ns = non-significant.

*** $p < .001$.

* $p < .05$.

$p < .001$; Wald's $\chi^2(3) = 48.13$, $p < .001$; Wald's $\chi^2(3) = 72.48$, $p < .001$; Wald's $\chi^2(3) = 24.36$, $p < .001$, respectively). The subsequent analyses using paired comparisons specified differences between the profile groups.

3.4.1.1. High-OE profile group. Paired comparisons suggested, first, that in the High-OE profile group, the individual mean levels of students' situational behavioral/cognitive engagement, emotional engagement, and competence experiences were significantly higher, and disaffection and help-seeking significantly lower than in the other three profile groups (Table 5).

3.4.1.2. Low-OE profile group. Comparisons between the Low-OE profile group and the other profile groups (Table 5) indicated that both situational behavioral/cognitive engagement and emotional engagement were significantly lower in the Low-OE profile group than in all other profile groups. Furthermore, situational competence experiences were significantly lower in the Low-OE profile group when compared to the High-OE and Mid-OE + High-FG profile groups, but not when compared to the Mid-OE group. For the situational

Table 5

Mean levels of situational engagement and estimates of paired comparison analyses between the profile groups.

	<i>M(SD)</i>	Estimates based on paired group comparisons		
		Low-OE	Mid-OE	Mid-OE + High-FG
High-OE (<i>n</i> = 89)				
Situational behavioral/cognitive engagement	3.54 (0.52)	− 1.20***	− 0.60***	− 0.46***
Situational emotional engagement	3.48 (0.72)	− 1.16***	− 0.60***	− 0.41***
Situational disaffection	1.92 (0.64)	0.74***	0.54***	0.48***
Situational competence experiences	3.98 (0.63)	− 0.86***	− 0.64***	− 0.27**
Situational help-seeking	1.71 (0.65)	0.41*	0.44***	0.21*
Low-OE (<i>n</i> = 14)				
Situational behavioral/cognitive engagement	2.30 (0.71)		0.60***	0.74***
Situational emotional engagement	2.30 (0.87)		0.56**	0.75***
Situational disaffection	2.65 (0.78)		ns	ns
Situational competence experiences	3.07 (0.87)		ns	0.59**
Situational help-seeking	2.01 (0.63)		ns	ns
Mid-OE (<i>n</i> = 114)				
Situational behavioral/cognitive engagement	2.92 (0.45)			ns
Situational emotional engagement	2.84 (0.58)			0.19*
Situational disaffection	2.47 (0.58)			ns
Situational competence experiences	3.31 (0.54)			0.37***
Situational help-seeking	2.10 (0.66)			− 0.23**
Mid-OE + High-FG (<i>n</i> = 84)				
Situational behavioral/cognitive engagement	3.08 (0.60)			
Situational emotional engagement	3.08 (0.67)			
Situational disaffection	2.40 (0.58)			
Situational competence experiences	3.73 (0.67)			
Situational help-seeking	1.86 (0.59)			

Note. Means represent average values for profile groups calculated by utilizing students' individual mean levels of situational engagement.

ns = non-significant.

*** $p < .001$.

** $p < .01$.

* $p < .05$.

disaffection and help-seeking, significant differences were found only in comparison to the High-OE profile group.

3.4.1.3. Mid-OE profile group. Comparisons between the Mid-OE profile group and the other profile groups (see Table 5) indicated that situational behavioral/cognitive engagement and emotional engagement were significantly higher in the Mid-OE profile group than in the Low-OE profile group, but significantly lower than in the High-OE profile group. Situational emotional engagement was also significantly lower in Mid-OE profile group than in Mid-OE + High-FG profile group. Furthermore, situational competence experience was significantly lower and situational help-seeking significantly higher in Mid-OE profile group than in the High-OE and Mid-OE + High-FG profile groups. With situational disaffection, differences were found only in comparison to the High-OE profile group.

3.4.1.4. Mid-OE + High-FG profile group. Comparisons between the Mid-OE + High-FG profile group and the other profile groups (Table 5) indicated that situational behavioral/cognitive engagement, emotional engagement, and competence experiences were significantly higher in the Mid-OE + High-FG profile group than in the Mid-OE and Low-OE profile groups, but lower than in the High-OE profile group. Furthermore, situational help-seeking was significantly lower in the Mid-OE + High-FG profile group than in the Mid-OE profile group, but significantly higher than in High-OE profile group, and situational disaffection was significantly lower in the Mid-OE + High-FG profile group than in the High-OE profile group.

3.4.2. Variation of situational engagement across lessons

Finally, the two-level models examining differences in variation of students' situational engagement across lessons demonstrated significant results for both situational emotional engagement and

situational disaffection (both models saturated and Wald tests of parameter constraints were significant: Wald's $\chi^2(3) = 10.68$, $p = .014$; Wald's $\chi^2(3) = 10.00$, $p = .019$, respectively). Subsequent pairwise comparisons (between level) suggested bigger variances of situational emotional engagement in the High-OE and Mid-OE + High-FG groups than in the Mid-OE group ($\beta = 0.16$, $p = .042$; $\beta = 0.24$, $p = .005$, respectively), and a smaller variance of situational emotional engagement in the Low-OE group than in the Mid-OE group ($\beta = -0.30$, $p = .037$). Furthermore, the results of pairwise comparisons with regard to situational disaffection showed significantly smaller variance of disaffection in the High-OE and Mid-OE profile groups than in the Mid-OE + High-FG profile group ($\beta = -0.21$, $p = .003$; $\beta = -0.15$, $p = .025$, respectively). For the models on situational behavioral/cognitive engagement, competence experiences, and help-seeking, the results did not show any significant differences in variation of students' situational engagement across lessons between the profile groups.

4. Discussion

The present study contributes to the literature by utilizing person-oriented approach to identify subgroups of students with different overall engagement profiles, and by examining these subgroups with respect to background factors, academic performance, and lesson-specific situational engagement. The findings indicated differences in GPAs between students belonging to the four distinct profiles of overall engagement. Moreover, the findings provided new insights into the associations between overall and situational engagement by identifying some concordance between them, but also showing situational fluctuation of engagement in particular for the group of students with high overall engagement.

First, as expected (Hypothesis 1), distinct subgroups based on

students' self-ratings of their overall engagement were identified. Three of the subgroups, named as High-Overall-Engagement (*High-OE*; 29.5% of students), Low-Overall-Engagement (*Low-OE*; 4.7% of students), and Mid-Overall-Engagement (*Mid-OE*; 37.9% of students), showed relatively concordant patterns of low, moderate, and high overall engagement (i.e., these profiles showed flat levels of overall engagement on all five indicators at their respective levels). The students with moderate overall engagement (*Mid-OE*) constituted the largest profile group, and in line with the findings of another Finnish lower secondary school sample (Virtanen et al., 2018), students with the lowest overall engagement (*Low-OE*) constituted the smallest profile group. The fourth profile group manifested a mixed pattern across the five subscales capturing the three dimensions of overall engagement. This profile group, named as Mid-Overall-Engagement-with-High-Future-Goals (*Mid-OE + High-FG*; 27.9% of students), differed from the *Mid-OE* profile group only by higher level of future aspirations and goals, and stronger sense of family's emotional support and reassurance when needing support in their learning at school. The *Mid-OE + High-FG* and the *High-OE* profile group did not differ with respect to future aspirations and goals.

The finding that the majority of students (72.1%) manifested concordant profiles across behavioral, emotional, and cognitive overall engagement can be seen to provide support to prior views that different dimensions of engagement are somewhat reciprocally linked (e.g., Fredricks et al., 2004; Wang et al., 2011; Wang & Peck, 2013). The identification of a mixed profile representing almost one third of the students, however, points out that assumption of comparable levels of the three dimensions engagement does not hold for all students. It seems that some individuals may convey high cognitive engagement with respect to appreciation of school and high future education goals, but at the same time report less high behavioral and emotional engagement (see also Linnankylä & Malin, 2008). Capturing this mixed profile complements the prior literature by consolidating the notion that students represent a heterogeneous population where distinct subgroups of engagement can be identified (see also e.g., Lawson & Masyn, 2015b), and highlights the importance of utilizing person-oriented approach in order to offer individualized forms of opportunities to become engaged in learning. In addition, the present findings raise future aspirations and goals into a pivotal role of cognitive engagement, and concur with examining them along with self-regulation strategies when striving to understand the multifaceted nature of cognitive engagement (see also Betts, 2012; Fredricks & McColskey, 2012).

Second, comparison of the profile groups showed in line with Hypothesis 2a, that the subgroups differed to some extent based on distribution of students' background factors. Consistent with prior findings (e.g., Lam et al., 2016; Li & Lerner, 2011), the proportion of boys was higher than that of girls in the *Low-OE* group and lower than that of girls in the *Mid-OE + High-FG* and *High-OE* groups. In contrast to some prior findings (e.g., Linnankylä & Malin, 2008) maternal education level was found to be independent of profile group membership when comparing *High-OE*, *Mid-OE*, and *Low-OE* groups to each other. However, maternal education was higher in the *Mid-OE + High-FG* group than in the *Mid-OE* group, which suggests that parents and their education may have an important role in shaping of students future goals and supporting their engagement (see e.g., Skinner & Pitzer, 2012). In motivational research, the role of parents is widely acknowledged, for instance, there is ample evidence that parents' beliefs have links to their children's beliefs, especially with respect to school-, classroom-, and learning-related competence beliefs and values (see Lazarides et al., 2015). More research is needed on this finding to learn about mechanisms through which parental education impacts children's cognitive engagement.

In keeping with Hypothesis 2b and prior literature (e.g., Wang & Holcombe, 2010), association was found between level of engagement and students' GPAs: profile groups with higher overall engagement manifested higher academic performance, whereas groups with lower

overall engagement manifested lower academic performance. Interestingly, students who reported moderate overall engagement but relatively high future aspirations and goals (i.e., *Mid-OE + High-FG* profile group) did not differ in academic GPAs from students who reported high overall engagement across all the three domains (i.e., *High-OE* profile group). This finding, which links academic success with value students place on schoolwork for their future paths, corroborates prior studies suggesting the high importance of future goals (e.g., Simons et al., 2004).

Third, the four profile groups were examined with respect to level and variation of situational engagement to gain insight on the associations between overall and situational engagement. In line with expectations (Hypothesis 3) and prior findings showing correlations between overall and situational engagement (Authors, 2016), the results indicated that the students' situational ratings of behavioral/cognitive and emotional engagement were highest in the *High-OE* profile group and lowest in the *Low-OE* profile group. However, in the *Mid-OE* and *Mid-OE + High-FG* profile groups the links between students' situational and overall engagement were not as consistent. Emotional engagement assessed with InSitu after lessons was significantly higher among students in the *Mid-OE + High-FG* profile group than in the *Mid-OE* group, but no significant differences were found between these profile groups for behavioral/cognitive engagement. Therefore, these findings suggest that situational engagement should not be assumed as identical students manifesting somewhat moderate overall engagement. Of specific interest is why the two profile groups showed differences in emotional engagement in the lessons rather than behavioral/cognitive engagement although students in the *Mid-OE + High-FG* profile group had higher GPAs than students in *Mid-OE* profile group. Based on these findings, it can be speculated, for example, that experiences of emotional engagement, such as enjoyment and interest in the lesson, may fluctuate more and may be more susceptible to contextual changes than situational behavioral/cognitive engagement.

In addition, while students belonging to the *High-OE* profile reported systematically lower levels of disaffection than students in the other three profile groups did, level of situational disaffection did not differentiate the other profile groups. Therefore, only uniformly high overall engagement seemed to function as a protective factor against maladaptive behaviors and emotions experienced in lessons. Even high future aspirations and goals, on its own, did not seem to set a buffer against feelings of boredom or lack of interest in the lessons. This finding can be seen to support conceptualizing of disengagement and engagement as distinct constructs (see Skinner et al., 2009), but more research is needed to capture the dynamics of disaffection via repeated measurements in classroom situations with a more in depth focus on potential differences among students showing somewhat high, moderate, and low overall engagement.

Moreover, with respect to situational competence experiences, profile groups with concordant patterns of low or moderate overall engagement did not differ from each other, but they differed from the *High-OE* and *Mid-OE + High-FG* groups. This finding is not surprising considering the higher academic skill level (as indicated by higher GPA) of the *High-OE* and *Mid-OE + High-FG* profile groups which is likely to feed into higher self-efficacy, achievement motivation, task value, and higher likelihood of facing tasks with their subject-specific skills (see, e.g., Eccles et al., 2015). This finding suggests a need for ways of scaffolding competence experiences in classroom situations especially among those students with low or moderate overall engagement and low or moderate future goals and aspirations.

Finally, analysis on intra-individual variation in situational engagement indicated profile group differences in emotional engagement and disaffection in classroom situations. Intra-individual variation in emotional engagement (i.e., variances of InSitu ratings between lessons) was higher among students in the *High-OE* and *Mid-OE + High-FG* profile groups than in the *Mid-OE* profile group, and, in turn, higher in the *Mid-OE* group than in the *Low-OE* group. With respect to

disaffection, intra-individual variation between lessons was lower among students in the High-OE and Mid-OE profile than students in the Mid-OE + High-OE profile group. Therefore, the findings seem to suggest that students with higher overall engagement, are likely to be more responsive to changing factors within the contexts, which is shown by a higher range of variation of positive emotions (high interest in some lessons and low in some others) but a narrow range of variation of negative emotions (variance in disaffection low between lessons). It can be speculated that differences in instructional practices and task characteristics (Fredricks, 2011; Lam et al., 2016), teacher's emotional support (Pöysä et al., 2019), or students' perceptions of peers' attitudes toward subjects and tasks (King, 2016) may be picked up by and having a stronger impact on students who exhibit higher overall engagement. This may also imply that students with lower overall engagement do not respond as readily to externally changing factors and their situational emotional engagement may remain low despite of teacher endeavors to support their engagement in the lessons. With respect to disaffection, question remains if concordant level of overall engagement could serve as a protective factor against changing experiences of disaffection. All in all, these findings suggest that students with different patterns of overall engagement have both unique strengths and liabilities with respect to fluctuation of situational engagement.

Taken together, the findings of the present study contribute to the literature by increasing understanding on the links between students' overall and situational engagement. Based on the findings bringing forth subgroup differences among students in how their overall engagement may affect and reflect their behaviors, emotions, and cognition in lesson to lesson situations in the classroom, some steps can be taken toward seeing overall and situational engagement as transactionally associated. It seems that students' situational experiences may be partly formed on basis of their generalized perceptions and affects about school as well as the value they place for schoolwork and its importance for their future. The view of dynamic shaping of engagement is in line with the proposal made by Lawson and Lawson (2013) that situational acts of engagement, that occur in particular moments of time, are formed partly on basis of engagement dispositions. Based on the four distinct profiles, it seems that students identified with high or low overall engagement show somewhat corresponding levels of situational engagement, but among students with moderate overall engagement (Mid-OE and Mid-OE + High-FG groups) the links between students' situational and overall engagement were not as consistent. In addition, the findings suggested that intra-individual fluctuation in situational engagement may have associations with overall engagement, and that the level of overall engagement is likely to affect the students' experiences of facilitating factors of engagement present in classroom situations. These findings provide, therefore, a unique empirical support complementing prior theoretical views on relations between overall and situational engagement, and adds by specifying findings with respect to different profiles. Knowledge on how overall engagement is related to situational engagement is particularly important when designing interventions and supporting students through pedagogical choices, as those actually take place in series of different situations. Understanding on how students arrive into different situations guided by their overall engagement, may also set the stage on more individualized support. In general, the findings highlighted the importance of examining student engagement by utilizing a person-oriented approach and acknowledging the impact of overall engagement when examining situational engagement.

4.1. Limitations and future research

The present study includes some limitations. First, due to the criterion of a minimum of three ratings of situational engagement for each participant, the results were based on data provided by a subgroup of 301 students. Although the preliminary analyses showed no differences in overall engagement between the current sample and other students

participating in the follow-up, the number of students in the Low-OE profile was quite small. Thus, in future studies utilizing a person-oriented approach, the sample should preferably be bigger. Increasing the sample size would allow collecting students experiences tied into specific subjects or other contextual factors as well. Second, for the analyses of situational engagement InSitu items capturing behavioral and cognitive engagement had to be merged into one indicator due to psychometric reasons. This created some disparity between the construct of indicators of overall and situational engagement. Such links between aspects included in behavioral and cognitive engagement have also been reported in previous research with respect to these dimensions (e.g., Reschly & Christenson, 2012). Thus, future research should seek ways to distinguish between these two components at situational level. Third, by utilizing the person-oriented approach, it was possible to identify groups with different overall engagement, but the design did not allow specifying what promotes or hinders individuals' engagement in actual learning situations. Finally, a longitudinal follow-up design was not used in the strict sense in the present study as both overall and situational engagement were assessed in the Spring of Grade 7 and the interval between assessments was not long. The next step would be to use several time points of parallel assessments at both overall and situational level to investigate effects of situational and overall engagement on each other, and continue to use person-oriented approach to track whether students' would remain within the same subgroup over time.

4.2. Conclusion and practical implications

By utilizing a person-oriented approach to examine the situational engagement and academic performance of individuals with varying profiles of overall engagement, the study complement the literature and provides practical implications. First, the present findings suggested that overall and situational engagement are related, but relation is not identical among all students. When planning interventions or developing ways to support students' engagement using different pedagogical practices, knowledge on situational engagement is critical for tailoring support to match the needs of each student. Second, the findings suggest that students with moderate overall engagement deserve more attention. They reported comparable levels of situational competence experiences and disaffection as students with low overall engagement, which needs to be acknowledged in the instructional practices. Third, the findings highlighted the importance of having future aspirations and goals. Based on results, those contributed to reaching higher situational engagement and academic performance, and, thus, it might be that students' situational engagement could be enhanced through aiming high in future. Finally, the results corroborated the added value of combining a person-oriented approach and focusing on students' overall engagement and their situational experiences simultaneously. Such design reveal distinctive features that are highly informative with respect to planning interventions and school-level guidance aimed at promoting engagement. By gaining insight on the links between overall and situational engagement, the schools can better accommodate students' individual needs and foster experiences of belonging, meaningfulness, and participation in learning situations.

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