

**THE ASSOCIATIONS OF STUDENT  
TEMPERAMENT TYPE, GENDER AND TEACHER  
TEMPERAMENT TYPE WITH ADOLESCENT  
WELL-BEING IN SCHOOL**

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PUONTI, VILLE: The Associations of Student Temperament Type, Gender and Teacher Temperament Type with Adolescent Well-being in School

Master's thesis, 46 p., 2 appendices

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This research, as part of the *STAIRWAY – From Primary School to Secondary School* -longitudinal study, examined (a) gender differences in the temperaments of Finnish sixth-grade students and their teachers, (b) whether three previously established types of temperament, Resilient, Undercontrolled and Overcontrolled, could be extracted from the temperament data of the students and the teachers, (c) differences in student well-being in school based on student temperament type and gender, and (d) whether the associations of student temperament type and gender with student well-being in school would be different depending on teacher temperament type. Self-ratings of temperament were obtained from 577 students and 40 teachers using a modified version of the Early Adolescent Temperament Questionnaire - Revised (EATQ-R) and The Adult Temperament Questionnaire (ATQ). Students assessed their well-being in school (in terms of school satisfaction, schoolwork related stress and anti-school attitudes) using a self-report questionnaire. The results showed that both student temperament type and gender were associated with student well-being in school after controlling for students' academic skills: students exhibiting the Resilient temperament type (characterized by high levels of Effortful control and Surgency, and a low level of Negative affectivity) reported higher well-being in school than students exhibiting the Undercontrolled type (characterized by a high level of Surgency, a low level of Effortful control, and an average level of Negative affectivity) or the Overcontrolled type (characterized by an average level of Effortful control, a high level of Negative affectivity, and a low level of Surgency). Furthermore, girls reported higher well-being in school than boys. Finally, the results showed that the associations of student temperament type and gender with student well-being in school did not differ based on teacher temperament type. The results of this study suggest that teachers should work together with their students to create classroom environments that fit the different temperamental predispositions of the students in order to achieve higher well-being in students of all temperament types.

Keywords: temperament, temperament type, gender differences, well-being, school adjustment, goodness of fit, RUO, ARC, resilient, resiliency, undercontrolled, overcontrolled

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Tässä *TIKAPUU – Alakoulusta yläkouluun* -pitkittäistutkimukseen kuuluvassa tutkimuksessa selvitettiin (a) suomalaisten kuudesluokkalaisten ja heidän opettajiensa keskuudessa esiintyviä sukupuolieroja temperamentissa, (b) sitä, oliko oppilaiden ja opettajien temperamenttidatasta löydettävissä kolme vakiintunutta temperamenttityyppiä (joustava, alikontrolloiva ja ylikontrolloiva), (c) oppilaiden temperamenttityyppien ja sukupuolten välisiä eroja kouluhyvinvoinnissa, sekä (d) sitä, olivatko oppilaan temperamenttityypin ja sukupuolen yhteydet oppilaan kouluhyvinvointiin erilaisia riippuen opettajan temperamenttityypistä. Itsearviot temperamentista kerättiin 577 oppilaalta ja 40 opettajalta käyttämällä muokattua versiota The Early Adolescent Temperament Questionnaire – Revised (EATQ-R) -kyselystä sekä The Adult Temperament Questionnaire (ATQ) -kyselyä. Oppilaiden kouluhyvinvointia (kouluviihtyvyyden, koulutyöhön liittyvän stressin ja kouluvastaisten asenteiden suhteen) selvitettiin itsearviointilomakkeella. Tulokset osoittivat, että oppilaan temperamenttityyppi ja sukupuoli olivat yhteydessä oppilaan kouluhyvinvointiin silloinkin, kun oppilaan koulutaidot oli kontrolloitu. Joustavaa temperamenttityyppiä ilmentävät oppilaat (joita luonnehti korkea tahdonalainen itsesäätely ja ulospäinsuuntautuneisuus, sekä matala negatiivinen emotionaalisuus) raportoivat parempaa kouluhyvinvointia verrattuna alikontrolloiviin oppilaisiin (joita luonnehti korkea ulospäinsuuntautuneisuus, matala tahdonalainen itsesäätely sekä keskiarvoinen taso negatiivisessa emotionaalisuudessa) ja ylikontrolloiviin oppilaisiin (joita luonnehti keskiarvoinen taso tahdonalaisessa itsesäätelyssä, korkea negatiivinen emotionaalisuus sekä matala ulospäinsuuntautuneisuus). Lisäksi tytöt arvioivat kouluhyvinvointinsa paremmaksi kuin pojat. Oppilaan temperamenttityypin ja sukupuolen yhteyksissä oppilaan kouluhyvinvointiin ei havaittu opettajan temperamenttityypistä riippuvia eroja. Tämän tutkimuksen tulosten perusteella suositellaan, että opettajat pyrkivät yhteistyössä oppilaidensa kanssa luomaan oppilaiden erilaisten temperamenttitaipumusten kanssa yhteensopivia luokkaympäristöjä, jotta kaikkien oppilaiden kouluhyvinvointia voidaan parantaa.

Avainsanat: temperamentti, temperamenttityyppi, sukupuolierot, hyvinvointi, kouluhyvinvointi, sopeutuminen, yhteensopivuus, RUO, ARC, joustava, joustavuus, alikontrolloiva, ylikontrolloiva

## INTRODUCTION

Most children in the industrialized countries spend a great deal of time in their childhood at school. Therefore it is not insignificant how they experience attending school and being in the classroom environment. Positive experiences in school, related to factors such as good teacher-student relationships and the promotion of student participation in the school life, have been associated with higher levels of well-being and lower amounts of risky health behaviors, such as drug abuse, among adolescent students (Fletcher, Bonell, & Hargreaves, 2008). Conversely, negative school experiences related to, for example, social alienation and poor teacher-student relationships, have been linked to lower levels of adolescent student well-being and an increased risk of academic failure and dropping out (Archambault, Janosz, Morizot, & Pagani, 2009; Fletcher, Bonell, & Hargreaves, 2008). However, what one student may consider a positive experience, another may find stressful and unpleasant. These differences in students' responses to the classroom environment and their ways of interacting with it are largely influenced by individual differences in student temperament (Keogh, 2003).

Research on the goodness of fit between student temperament and the classroom environment, however, is thus far scarce (Martin, 2012) and calls for more research from this perspective (Al-Hendawi, 2013). In particular, only a few studies examine the goodness of fit between teacher and student temperament (Martin, 2012; Nowak, 2008; Scott, 2004; Vitiello et al., 2012), despite its importance to teacher-student relationships and, by extension, to student well-being (Lipscomb et al., 2014) and even grading (Keltikangas-Järvinen & Mullola, 2014; Keogh, 2003). Additionally, many previous studies on this topic focus exclusively on early education settings, and suffer from significant methodological limitations for not using distinct measures for temperament and well-being (Al-Hendawi, 2013).

Research examining the factors affecting student well-being in school is also of particular societal significance in Finland due to the low ranking of Finnish elementary school students (attending 5th, 7th and 9th grade) in international comparisons on how much they enjoy going to school (Currie et al., 2012). In these comparisons, it was also noted that gender appears to play a part in the school well-being of Finnish adolescents, as girls reported enjoying school more than boys did during 7th and 9th grade (Currie et al., 2012). Consequently, the aims of the present study were to examine (a) gender differences in the temperaments of Finnish sixth-grade students and their teachers, (b) whether three previously established types of temperament, Resilient, Undercontrolled and Overcontrolled, could be extracted from the temperament data of the students and the teachers, (c) differences in

student well-being in school (in terms of school satisfaction, schoolwork related stress and anti-school attitudes) based on student temperament type and gender, and (d) whether the associations of student temperament type and gender with student well-being in school would be different depending on teacher temperament type.

## **The Developmental Model of Temperament**

In the present study temperament is conceptualized using Rothbart and Derryberry's (1981) developmental model, which defines temperament as constitutionally based individual differences in reactivity and self-regulation. *Constitutional* refers to the biological basis of temperament, which is influenced over time by heredity, maturation and the interaction between the individual's innate temperamental characteristics and the environment. *Reactivity* refers to the individual physical and emotional differences in reactions to stressful or novel stimuli (i.e., the excitability of the physiological and behavioral systems), while *self-regulation* refers to differences in the processes of activation, attention and inhibition (i.e., the neural and behavioral processes modulating reactivity) (Rothbart & Derryberry, 1981; Viñas, González, Malo, García & Casas, 2014). Early differences in temperament are assumed to be the precursor of the later development of personality (Derryberry & Rothbart, 1997; Rothbart, Ahadi, & Evans, 2000), which refers to a broader domain of characteristics, including such conceptual domains as values, beliefs, and attitudes (Rothbart & Bates, 2006). While temperamental characteristics are considered to be fairly stable across different contexts and over time (see Bates, Schermerhorn, & Goodnight, 2010, for a review), the structure of temperament is assumed to vary at different ages during the lifespan. In other words, new dimensions of temperament may emerge over time as a result of maturation (Derryberry & Rothbart, 1997; Teglasi, 1995).

Three major dimensions of temperament have been identified within Rothbart and Derryberry's (1981) developmental model: (a) *Effortful control*, which includes aspects like inhibitory control and attentional focusing, (b) *Negative affectivity*, which consists of elements like fear and social discomfort, and (c) *Surgency/Extraversion*, which is composed of facets such as positive anticipation and sensation seeking (Posner & Rothbart, 2007; Rothbart & Bates, 2006). Two further age-specific dimensions, *Affiliativeness* and *Orienting sensitivity*, are thought to emerge in early adolescence, that is, at 10 to 15 years of age (Ellis & Rothbart, 2001) and in adulthood (Rothbart, Ahadi, & Evans, 2000), respectively. Both consist of facets such as perceptual sensitivity and pleasure sensitivity. The aforementioned temperament dimensions have been found to correlate with the Big Five personality

dimensions of Conscientiousness (Effortful control), Neuroticism (Negative affectivity), Extraversion (Surgency/Extraversion) and Openness to experience (Affiliativeness/Orienting sensitivity) (Evans & Rothbart, 2007; Rothbart, 2007).

Some gender differences in these temperament dimensions have been identified in previous research. Girls typically score higher than boys in the dimensions of Effortful control and Affiliativeness, while boys tend to be higher than girls in Surgency (Ellis, 2002; Ellis & Rothbart, 2001; Else-Quest et al., 2006). In adult samples, women have been shown to be higher than men in Sociability (a sub-dimension of adult Surgency), Orienting sensitivity and Negative affectivity (Pulkkinen, Kokko & Rantanen, 2012; Wiltink, Vogelsang, & Beutel, 2006).

Rothbart and Derryberry's (1981) developmental model of temperament does not place emphasis on any specific dimension of temperament, rather, individual temperament is conceptualized as the constellation of the different dimensions (e.g., a student with high Surgency and high Effortful control will differ considerably from a student with high Surgency and low Effortful control). This perspective allows for a typological (i.e., person centered) approach to temperament, which considers the ways in which temperament traits are organized and integrated within the individual (Laursen & Hoff, 2006). It is, after all, the individual, rather than their isolated traits, who engages in dynamic transactions with their social environments (Donellan & Robins, 2010). Next, we will consider an established theory of three types of temperament and personality: Resilient, Undercontrolled and Overcontrolled.

### **The Resilient, Undercontrolled and Overcontrolled Temperament Types**

Research on the development of personality in the past 20 years has provided evidence of three distinct types of personality, replicable across time, statistical methods and different cultures: Resilient, Undercontrolled and Overcontrolled (Allessandri et al., 2014; Chapman & Goldberg, 2011; see Donellan & Robins, 2010, for a review). In previous literature, these types are collectively known either as the RUO types, based on their acronym, or as the ARC types, named so after their leading researchers: Jens Asendorpf, Richard Robins and Avshalom Caspi (Costa, Herbst, McCrae, Samuels, & Ozer, 2002). In the present study, the RUO acronym is used to refer to these types. *Resilient* individuals are characterized by self-confidence, self-direction, emotional stability, and a positive orientation toward others. *Undercontrolled* individuals are generally stubborn, physically active, disobedient and impulsive. *Overcontrolled* persons are often emotionally brittle, sensitive, introverted

and tense, but also dependable (Donellan & Robins, 2010). Gender differences in the distribution of the RUO types have also been observed among adolescents: boys tend to be overrepresented in the Undercontrolled group, while girls usually form the majority of Overcontrollers (Meeus, van de Schoot, Klimstra, & Branje, 2011).

According to Rothbart (2011), it is possible to relate the RUO types to the dimensions of temperament described in the developmental model (Rothbart & Derryberry, 1981). Indeed, in a study by Komsis and colleagues (2006), the RUO types were extracted from the temperament data of infants and children up to 5.5 years old: *Resilient* children showed high self-confidence, Surgency and Effortful control (the ability to concentrate on tasks). *Undercontrolled* children were high in Surgency and Negative affectivity, but low in Effortful control. *Overcontrolled* children were more introverted (low in Surgency) and high in Effortful control and more fearful (shy).

The RUO types have been shown to have incremental validity beyond that of single temperament dimensions when examining developmental outcomes, such as problem behavior and academic achievement (Asendorpf & Denissen, 2006; Hart et al., 2003). For example, Undercontrolled boys generally have lower school achievement, worse conduct and more juvenile delinquency compared to Overcontrolled and Resilient boys (Robins et al., 1996). Undercontrolled boys are also at a greater risk for both externalizing (e.g., aggressive behavior) and internalizing (e.g., depression and anxiety) problems compared to Resilient and Overcontrolled boys, although Overcontrolled boys are also at a higher risk for internalizing problems (Robins et al., 1996). These results have later been replicated for adolescents of both genders (e.g., Klimstra et al., 2010). Additionally, in a study by Vitiello and colleagues (2012) it was found that Undercontrolled children made greater gains in math in preschool classrooms with higher emotional support, while Overcontrolled children made greater math gains in classrooms with higher instructional support. In order to understand how these differences may come about, we must consider the interaction between student temperament and the demands of the classroom environment. This point of view is embodied in the concept of goodness of fit, to which we next turn to.

### **The Goodness of Fit of Student Temperament and Student Well-being in School**

The term goodness of fit was first defined by Thomas & Chess (1977, p. 11) as the interaction that “results when the properties of the environment and its expectations and demands are in accord with the organism's own capacities, characteristics, and style of behaving”. When there is a good match,

that is, a good fit, between the individual and the environment, positive development can occur, whereas a poor match (i.e., poor fit), between the individual and the environment may lead to maladaptive functioning and distorted development (Thomas & Chess, 1977). Goodness of fit in children, in particular, relates to whether the child's capacities, motivation and temperament are adequate to master the demands, expectations and opportunities of his or her environment (Chess & Thomas, 1996). Previously, it has been shown that high levels of temperamental Effortful control and Affiliativeness and a low level of Shyness are associated with higher subjective well-being (in terms of satisfaction with different aspects of life, such as relationships with other people) in adolescents (Viñas et al., 2014). Simultaneously exhibiting high Effortful Control and low Shyness (i.e., higher Surgency) can be seen as indicative of the Resilient temperament type (see Komsis et al., 2006), which can be assumed to generally facilitate fit with most environments and therefore lead to increased well-being in adolescents.

In the context of the classroom environment, three aspects have been suggested to play an important role in the goodness of fit of students: 1) *the content and nature of the curriculum and modes of instruction*, 2) *the organization and management of space, time and resources*, and 3) *the nature of the interactions between students, peers and teachers* (Keogh & Speece, 1996). Many of these aspects can be influenced by the classroom teacher, especially their relationship with their students. It is worth noting that the quality of the teacher-student relationship was also the second most mentioned factor (after peer relationships) in a recent study examining what factors Finnish 8th and 9th graders consider important to their own well-being in school (Janhunen, 2013). However, there is little research on the goodness of fit between teacher and student temperament (for exceptions, see Martin, 2012; Nowak, 2008; Scott, 2004; Vitiello et al., 2012), despite its suggested importance to teacher-student relationships and, by extension, to student well-being (Lipscomb et al., 2014).

Goodness of fit in the teacher-student relationship refers to the extent to which the characteristics of the teacher and the student are well matched (LaBillois & Lagacé-Séguin, 2009). Therefore, it is important to consider the expectations that a teacher has for student temperament (i.e., what kind of behavior a teacher considers acceptable or desired in their classroom) (Keogh, 2003; Lerner, 1983). These expectations are partially affected by the teacher's own temperament. For example, an innately extroverted teacher might expect overtly extroverted behavior from their students, which may lead to the marginalization of more introverted students (Keltikangas-Järvinen & Mulla, 2014). Therefore, it can be suggested that a teacher's temperament may make them more sensitive to the needs of some students (e.g., an inhibited teacher may be more understanding towards the shyness and inhibitions of a similar student), while also making it more difficult for the teachers to achieve a good fit with some students (e.g., a teacher and a student sharing similarly intensive and reactive temperament may



find their relationship to be quite tense) (Keogh, 2003). The extent to which a student's temperament matches the teacher's expectations for it (i.e., the goodness of fit) has been shown to be related to the quality of the teacher-student relationship and, consequently, aspects such as teaching practices and grading (Keltikangas-Järvinen & Mullola, 2014; Koles, O'Connor, McCartney, 2009; Spilt & Koomen, 2009). The temperamental predispositions of students exhibiting the Resilient type (self-confidence, self-direction, emotional stability, and a positive orientation toward others) are likely to match the expectations of the teacher and the classroom environment (Keltikangas-Järvinen & Mullola, 2014; Keogh, 2003), therefore resulting in good fit (Keogh, 2003; LaBillois & Lagacé-Séguin, 2009), a closer relationship with the teacher and increased well-being. Conversely, the temperamental dispositions of Overcontrolled (emotionally brittle, sensitive, introverted and tense) and Undercontrolled (stubborn, physically active, disobedient and impulsive) students are less likely to fit a teacher's expectations for desirable student behavior in his or her classroom (Keltikangas-Järvinen & Mullola, 2014; Keogh, 2003). This poor fit may increase internalizing and externalizing problem behavior in students with these temperament types (Carey, 1998), which in turn may lead to more conflict and less closeness in teacher-student relationships (Nurmi, 2012) and lower well-being in school (Lipscomb, 2014).

However, it should also be noted that teachers' expectations tend to be different for boys and girls, so the same kind of behavior might evoke different reactions from the teacher depending on the student's gender. For example, aggression may be seen more readily as a problem in girls than boys (Keltikangas-Järvinen & Mullola, 2014), which may prompt the teacher to react to aggression shown by girls more seriously.

### **The Limitations of Previous Research**

Previous studies on the associations between student temperament and student well-being in school suffer from some limitations. Arguably one of the most important concerns is the lack of clear distinction between measures of temperament and traditional indicators of student well-being or adjustment (e.g., social competence and behavioral problems), since items that are used as measures of behavioral problems may become re-conceptualized as measures of temperament (Al-Hendawi, 2013). This problem likely stems from the fact that the vast majority of studies have focused on children attending preschool or first grade (see Fernández-Vilar & Carranza, 2013, for a review), which means that teachers and parents are used as the primary informants, instead of the children

themselves. An important exception to this are two studies (Lerner, 1983; Lerner, Lerner & Zabski, 1985), examining the associations between adolescents' temperament and their adaptation and adjustment to school academic and social contexts, specifically from the perspective of goodness of fit. Unfortunately, the sample sizes in these studies are small, and either student temperament (Lerner, 1983) or adjustment (Lerner, Lerner & Zabski, 1985) was assessed by someone else than the students themselves (caregiver and teacher, respectively). While using caregivers and teachers as raters is a valid methodological approach, it would also be worthwhile to examine the associations between student temperament and well-being in school completely from the point of view of the students. The current study does this by having the students be the informants of their own temperament and well-being in school. In the present study, the term well-being is used instead of adjustment in order to emphasize the importance of the students' own interpretation of their well-being in school (in terms of school satisfaction, schoolwork related stress and anti-school attitudes), as opposed to equating adolescents' well-being in school to the lack of behavioral problems as perceived by parents or teachers.

Additionally, despite the important role of teacher characteristics in teacher-student relationships (Keogh, 2003), only a few previous studies have examined the interaction between teacher and student characteristics, such as temperament, in the context of goodness of fit (for exceptions, see Martin, 2012; Nowak, 2008; Scott, 2004; Vitiello et al., 2012). Furthermore, few studies examining the goodness of fit of student temperament have used Rothbart & Derryberry's (1981) developmental model of temperament, despite its advantages, such as understanding temperament as a complex construct involving an organized system of behavior, rather than just defining temperament in terms of separate traits, as well as allowing for changes in the expression of temperament during development (Al-Hendawi, 2013). Furthermore, studies that do use the developmental model of temperament (Rothbart & Derryberry, 1981) often focus either solely on Effortful control (e.g., Eisenberg et al., 2011; Loukas & Murphy, 2007) or Effortful control and Negative affectivity (e.g., Eisenberg et al. 2009, Janson & Mathiensen, 2008; Muris & Ollendick, 2005). Therefore, despite its suggested usefulness when attempting to examine individual differences among children (Fox & Henderson, 1999), a typological approach to temperament which simultaneously considers all major dimensions of temperament, that is, Effortful control, Negative affectivity, and Surgency, has rarely been applied in the school context (but see Vitiello et al., 2012).

The present study attempts to overcome the limitations of previous research in several ways: First, by using distinct measures for both student well-being in school and adolescent and adult temperament, the associations between them are likely to be less confounded. Secondly, using the goodness of fit perspective (Thomas & Chess, 1977) and the developmental model of temperament

(Rothbart & Derryberry, 1981) will allow for a contemporary theoretical perspective to be taken on temperament and its associations with adolescent well-being in school. In addition, the use of the RUO temperament types (see Donellan & Robins, 2010) allows for a shift of focus from examining single dimensions of temperament separately to studying the effects of the constellations of the different temperament dimensions within a person. This makes it possible to adapt a more person-oriented approach (Magnusson & Stattin, 2006), which is further emphasized by using the students as informants of their own temperament and well-being in school. Thus focus will be given to the students' own interpretation of their experiences and behavior.

### **The Aims of the Study**

The primary objective of the present study was to examine the associations of student temperament type, gender and teacher temperament type with adolescent well-being in school. The first aim was to (1) examine whether there would be gender differences in the temperaments of Finnish sixth-grade students and their teachers. Based on previous research, it was hypothesized that certain gender differences in temperament would emerge. First, in regard to student temperament, it was expected that girls would be higher than boys in Effortful control and Affiliativeness, whereas boys would be higher than girls in Surgency (Hypothesis 1a; see Ellis, 2002; Ellis & Rothbart, 2001; Else-Quest et al., 2006). Second, in regard to teacher temperament, it was expected for female teachers to be higher in Sociability, Orienting sensitivity and Negative affectivity than male teachers (Hypothesis 1b; see Pulkkinen, Kokko & Rantanen, 2012; Wiltink, Vogelsang, & Beutel, 2006).

The second aim of the present study was to (2) examine whether three temperament types established in previous research, Resilient, Undercontrolled and Overcontrolled (see Donellan & Robins, 2010), could be extracted from the temperament data of the students and the teachers. It was hypothesized that the RUO types would emerge both for the students and the teachers, and that their structure would be in accordance with previous research on the RUO temperament types (Hypothesis 2: see Donellan & Robins, 2010; Komsu et al., 2006).

The third aim was to (3) study differences in student well-being in school based on student temperament type and gender. It was hypothesized that students with the Resilient temperament type would report higher well-being in school due to their temperament type facilitating goodness of fit (Thomas & Chess, 1977) with the classroom environment, while students with the Undercontrolled and Overcontrolled temperament types would report lower levels of well-being compared to Resilient

students. Furthermore, Undercontrolled students were expected to report especially low well-being due to their temperament's likely poor fit with the classroom environment (Hypothesis 3a; see Keogh, 2003; Vitiello et al., 2012). Additionally, it was expected that girls would report higher well-being in school than boys (Hypothesis 3b; see Currie et al., 2012).

The final aim of the present study was to (4) examine whether the associations of student temperament type and gender with student well-being in school would be different depending on teacher temperament type. It was hypothesized that the Resilient temperament type in teachers would facilitate teacher-student goodness of fit the most, therefore leading to higher well-being in students with Resilient, rather than Undercontrolled or Overcontrolled teachers. It was further hypothesized that Overcontrolled students would benefit from having an Overcontrolled teacher due to their shared temperamental tendencies, while Undercontrolled students with an Undercontrolled teacher would report the lowest well-being of all (Hypothesis 4; see Keogh, 2003).

## **METHOD**

### **Participants and Procedure**

The present study is a part of the *STAIRWAY – From Primary School to Secondary School* -longitudinal study (Ahonen & Kiuru, 2013), the goal of which is to identify factors that support adolescents' learning, well-being in school and their successful transition from primary school to secondary school. Additionally, the *STAIRWAY* -study examines the effects of classroom stress factors on teacher work stress and adolescent learning. In the present study, the statistical analyses are based on a sample collected during the autumn semester of 2014, consisting of 577 students and 40 teachers from 39 sixth-grade classrooms ( $M = 20.5$  students,  $SD = 4.9$ ) in 25 schools located in the Central-Finland area.

Written consent to participate was obtained from the students' parents and the teachers before the beginning of the study. The students and their teachers reported their demographic information and assessed their temperament as part of a battery of questionnaires administered in the participating classrooms by two trained research assistants. Students' perception of their well-being in school was examined as part of a health and well-being questionnaire in this battery. Additionally, a parental questionnaire, including an inquiry about the level of education of a student's parents, was sent to each student's mother/father/other guardian. The University of Jyväskylä Ethical Committee has reviewed the research plan for the *STAIRWAY* -study and concluded that it contains no ethical problems.

### **The Students**

The student sample consisted of 577 adolescents (322 girls, 255 boys) aged 10 to 14 years ( $M = 12.3$  years,  $SD = 5.0$  months). The majority of students were attending sixth grade, however, the sample also included 25 fifth-graders (17 girls, 8 boys) from combined classrooms. Most students (96.2%) reported Finnish as their mother tongue. The majority of students (75.3%) reported living in a nuclear family (a family with two parents), while the second most commonly reported family structure was living in a family with shared parenthood after divorce or separation (11.7%). Additionally, 6.3% of

the students reported living with a single mother, 1.0% with a single father, and 5.1% in families consisting of the mother or the father living with her or his new spouse. Finally, 0.7% reported living in foster care or approved home. The current sample can be considered to be representative of the family structure distribution among adolescents of similar age living in Finland (Official Statistics of Finland, 2014a).

To determine parental level of education, the students' mothers/fathers/other guardians were asked to describe the level of their own and their spouse's education on a seven-point scale (1 = *No vocational education* (1.9% of mothers and 3.5% of fathers), 2 = *Short vocational courses* (1.7% / 5.0%), 3 = *Vocational education* (26.1% / 40.0%), 4 = *College of professional education* (22.2% / 16.6%), 5 = *University of Applied Sciences* (17.9% / 12.3%), 6 = *University* (25.6% / 17.7%), 7 = *Graduate university degree (licentiate or doctorate)* (4.5% / 4.8%)). Data was missing from 18.9% of mothers and 20.8% of fathers. It can be concluded that the parental level of education in the current sample is fairly representative of the Finnish adult population in general (Official Statistics of Finland, 2014b).

## **The Teachers**

The teacher sample consisted of 40 teachers (18 women, 22 men), aged between 27 and 61 years ( $M = 44.3$  years,  $SD = 10.0$  years). The most common degree held by the teachers (95%) was Classroom teacher/Master of Arts (Education). In addition, one teacher reported having a Special education teacher/Master of Arts (Education) degree and one teacher reported having both degrees. Additionally, two of the classroom teachers reported having a second university degree from a different discipline: one held a Master of Arts degree in Music and the other a Master of Science degree in Sport and Health Sciences. The special education teacher also reported having a Kindergarten Teacher/Master of Arts (Education) degree.

The majority (57.5%) of the teachers had over 15 years of work experience. Of the rest, 7.5% had worked as a teacher between 11 and 15 years, 20% between 6 and 10 years and 15% between 1 and 5 years. Most teachers (32.5%) had worked with their current class for 3 to 4 years, while 15% had worked with their class for over 4 years, 30% between 1 and 2 years, and 22.5% for under a year. The teachers reported spending between 12 and 25 hours per week teaching their class ( $M = 19.05$ ,  $SD = 2.8$ ).

## Measurements

**Student temperament.** Students assessed their temperament using the Finnish version of the Early Adolescent Temperament Questionnaire – Revised (EATQ-R) (Ellis & Rothbart, 2001; Finnish translation by K. Rääkkönen-Talvitie), a self-report questionnaire designed to assess temperament in adolescents aged 9 to 15 years, based on the developmental model of temperament (Rothbart & Derryberry, 1981). The original short form of the EATQ-R contains 65 statements, however, in the present study six additional statements adapted from the parent report version of the EATQ-R were added to the adolescent questionnaire in an attempt to address problems in subscale reliability that were discovered in a pilot study. Additionally, based on feedback from this pilot study, one item in the EATQ-R was replaced with a similar item from the parental version of the questionnaire (see Appendix 1 for details on these changes).

The EATQ-R asks adolescents to evaluate how true a given statement is to them on a 5-point Likert scale (1 = *Almost never true*; 5 = *Almost always true*). The short-form of the EATQ-R assesses the following sub-dimensions of temperament: (1) *Activation control (5 items)*, which refers to the capacity to perform an action when there is a strong tendency to avoid it ("If I have a hard assignment to do, I get started right away"), (2) *Affiliation (5 items)* encompasses the desire for warmth and closeness with others, independent of shyness or extraversion ("It is important to me to have close relationships with other people"), (3) *Attention (8 items)* includes the capacity to focus attention as well as shift attention when desired ("It is easy for me to really concentrate on homework problems"), (4) *Fearfulness (6 items)* refers to unpleasant affect related to anticipation of distress ("I worry about getting into trouble"), (5) *Frustration (8 items)* encompasses negative affect related to interruption of ongoing tasks or goal blocking ("I get irritated when I have to stop doing something that I am enjoying"), (6) *High-intensity pleasure (7 items)* refers to pleasure derived from activities involving high intensity or novelty ("I enjoy going places where there are big crowds and lots of excitement"), (7) *Inhibitory control (5 items)* is concerned with the capacity to plan and to suppress inappropriate responses ("It's easy for me to keep a secret"), (8) *Perceptual sensitivity (4 items)* refers to the detection or perceptual awareness of slight, low-intensity stimulation in the environment ("I tend to notice little changes that other people do not notice"), (9) *Pleasure sensitivity (5 items)* means pleasure related to activities or stimuli involving low intensity, rate, complexity, novelty, and incongruity ("I like to look at the pattern of clouds in the sky"), and (10) *Shyness (4 items)*, which is seen as behavioral inhibition to novelty and challenge, especially social ("I am shy"). Furthermore, the EATQ-R includes two behavioral scales: *Aggression* and *Depressive mood*, however, as these scales are conceptualized

more as a measure of social-emotional functioning rather than temperament (Ellis & Rothbart, 2001), they were not used in the current study. The aforementioned temperament sub-dimensions (subscales) form the four temperament dimensions (superscales): (1) *Effortful control* (consisting of Activation control, Attention and Inhibitory control), (2) *Negative affect* (referring to Frustration), (3) *Surgency* (composed of Fear (reverse coded), High-intensity pleasure, and Shyness (reverse coded)) and (4) *Affiliativeness* (containing Affiliation, Perceptual sensitivity, and Pleasure sensitivity).

Temperament scores for each of the subscales were computed by first recoding reversed items and then averaging the ratings across items belonging to the same subscale. The reliability of the subscales was assessed using Cronbach's alpha, which was found to be satisfactory for most subscales, however, three subscales (Attention, Inhibitory control, and High-intensity pleasure) failed to achieve an acceptable level of alpha (instead having alpha levels of .57, .45 and .59, respectively). In an attempt to increase reliability, all subscale items with an inter-item correlation below .20 were removed, resulting in the elimination of four items (see Appendix 1 for details) and alpha levels of .63 for Attention, .44 for Inhibitory control and .59 for High-intensity pleasure. It should be noted that some scholars prefer to use the raw average inter-item correlation as a marker of the internal consistency of a scale, since they consider Cronbach's alpha to be too sensitive to the number of items on a scale (Neuendorf, 2002). For example, Clark & Watson (1995) recommend that the average inter-item correlation (AIC) fall in the range of .15 to .50. With this in mind, the average inter-item correlations of the subscales were also examined and found to be within these limits (ranging from .17 to .49) after removing the aforementioned subscale items.

Scores for the temperament dimension superscales were computed by first recoding reversed subscales and then averaging the scores across relevant subscales. The alphas for the superscales ranged from .47 to .78 and the AICs from .23 to .47. Further details can be found in Table 1 under Results.

**Teacher temperament.** Teachers assessed their temperament using the Finnish version of the Adult Temperament Questionnaire (ATQ) (Rothbart, Ahadi & Evans, 2000; Finnish translation by K. Rääkkönen-Talvitie), a self-report questionnaire containing 77 statements, grounded in the developmental model of temperament (Rothbart & Derryberry, 1981). The ATQ asks participants to evaluate how well each statement describes them on a 7-point Likert scale (1 = *Describes me extremely poorly*; 7 = *Describes me extremely well*). The scale also includes a *Not applicable to me* option. The following sub-dimensions of temperament are assessed by the ATQ: (1) *Activation control* (7 items; e.g., "I can keep performing a task even when I would rather not do it"), (2) *Attention*



(5 items; e.g., "When interrupted or distracted, I usually can easily shift my attention back to whatever I was doing before"), (3) *Inhibitory control* (7 items; e.g., "It is easy for me to hold back my laughter in a situation when laughter wouldn't be appropriate"), (4) *Fearfulness* (7 items; e.g., "When I am enclosed in small places such as an elevator, I feel uneasy"), (5) *Frustration* (6 items; e.g., "I find it very annoying when a store does not stock an item that I wish to buy") and (6) *High-intensity pleasure* (7 items; e.g., "I would enjoy watching a laser show with lots of bright, colorful flashing lights"), all of which correspond to similar facets as they do in the EATQ-R (see above). Furthermore, the ATQ contains scales for the temperament sub-dimensions of (7) *Discomfort*, referring to negative affect related to sensory qualities of stimulation, such as intensity (6 items; e.g., "I find loud noises to be very irritating"), (8) *Sadness*, which is understood as negative affect and lowered mood and energy related to exposure to suffering, disappointment and object loss (7 items; e.g., "Sometimes minor events cause me to feel intense sadness"), (9) *Sociability*, consisting of enjoyment derived from social interaction and being in the presence of others (5 items; e.g., "I like conversations that include several people"), (10) *Positive affect*, encompassing the latency, threshold, intensity, duration, and frequency of experiencing pleasure (5 items; e.g., "It doesn't take much to evoke a happy response in me"), (11) *Affective perceptual sensitivity*, which refers to spontaneous emotionally valenced, conscious cognition associated with low intensity stimuli (5 items; e.g., "I tend to notice emotional aspects of paintings and pictures"), (12) *Associate sensitivity*, seen as spontaneous cognitive content that is not related to standard associations with the environment (5 items; e.g., "I sometimes seem to understand things intuitively"), and (13) *Neutral perceptual sensitivity* (5 items; e.g., "I'm often aware of the sounds of birds in my vicinity"). These subscales form the four temperament dimension superscales: (1) *Effortful control* (including Activation control, Attention and Inhibitory control), (2) *Negative affectivity* (consisting of Discomfort, Fearfulness, Frustration and Sadness), (3) *Surgency* (including High-intensity pleasure, Positive affect and Sociability), and (4) *Orienting sensitivity* (composed of Affective perceptual sensitivity, Associative sensitivity and Neutral perceptual sensitivity).

Temperament scores for each of the subscales were computed by first recoding reversed items and then averaging the ratings across items belonging to the same subscale. Cronbach's alpha for the temperament subscales was calculated and, again, found to be satisfactory for all but three subscales (Activation control (.52), Inhibitory control (.50) and Neutral Perceptual Sensitivity (.42)). Thus, all subscale items with inter-item correlations below .20 were removed, resulting in the removal of 10 items and satisfactory alpha levels for all subscales (ranging from .60 to .81) (See Appendix 2 for details on the removed items).

Scores for the temperament dimension superscales were computed by averaging the scores across relevant subscales. The examination of superscale reliability revealed a contradiction between the

theoretical model and the data, namely that the High-intensity pleasure subscale correlated negatively with the other Surgency subscales (Positive affect and Sociability). After ascertaining that this was not due to errors in coding the data, it was decided to not include the High-intensity pleasure subscale in computing the Surgency superscale score. This decision was supported by similar methodological choices in prior research made in Finland using the ATQ (Pulkkinen, Kokko, & Rantanen, 2012). The removal of the High-intensity pleasure subscale resulted in superscale alphas ranging from .32 to .58 and average inter-item correlations between .19 and .33. See Table 2 under Results for further details.

**Student well-being in school.** The self-report for assessing student well-being in school was created using 10 well-being related items from the Health Behavior in School-aged Children study (HBSC) (Currie et al., 2012). The HBSC study is an international comparative study examining students' perceived health and well-being, health behaviors and school experiences, which is conducted in cooperation with the World Health Organization's Regional Office for Europe. The questionnaire measures three dimensions of well-being in school: (1) *School satisfaction* (3 items; e.g., "I enjoy going to school"), (2) *Schoolwork related stress* (3 items; e.g., "I have too much schoolwork"), and (3) *Anti-school attitudes* (4 items; e.g., "I wish I didn't have to go to school") (see Konu, 2002; Kämpfi et al., 2012; Linnakylä & Malin, 1997). The students were asked to evaluate how much they agree with each statement on a 5-point Likert scale (1 = *Completely disagree*; 5 = *Completely agree*). A score for each student's well-being in school was obtained by first recoding reversed items and then averaging the ratings across all items on the scale. Cronbach's alpha for the created scale was .90 and the average inter-item correlation was .47.

## Statistical Analyses

The statistical analyses were performed using the IBM SPSS Statistics 22 -software. First, to examine possible gender differences in the temperaments of the students and the teachers, independent samples *t*-tests were used. Second, in order to see whether the RUO temperament types (Resilient, Undercontrolled and Overcontrolled; see Donellan & Robins, 2010) could be extracted from the temperament data of the students and the teachers, a *k*-means cluster analysis was performed and its results confirmed in a cross-validation of the data. As additional analyses, a chi-square test of

independence and Fisher's exact test were used to see if there was a relation between gender and temperament type in students and teachers, respectively.

Third, possible differences in student well-being in school based on student RUO temperament type were examined using a one-way ANOVA. Possible differences in student well-being in school by student gender were examined on the overall sample level and, as additional analyses, within each RUO temperament type group using independent samples *t*-tests. Differences in well-being in school between the RUO temperament type groups by gender were also examined using one-way ANOVAs. A two-way ANOVA was then used to test for possible interaction between student temperament type and gender.

Finally, in order to study whether the associations of student temperament type with student well-being in school would be different depending on teacher temperament type, one-way ANOVAs were used to compare student well-being in school between different combinations of student-teacher temperament types (1 = Resilient child – Resilient teacher, 2 = Resilient child – Undercontrolled teacher, 3 = Resilient child – Overcontrolled teacher, 4 = Undercontrolled child – Resilient teacher, 5 = Undercontrolled child – Undercontrolled teacher, 6 = Undercontrolled child – Overcontrolled teacher, 7 = Overcontrolled child – Resilient teacher, 8 = Overcontrolled child – Undercontrolled teacher, 9 = Overcontrolled child – Overcontrolled teacher) within each student temperament type group. As additional analyses, the associations of student and teacher temperament type with student well-being in school were examined by student gender by performing ANOVAs separately for boys and girls. Examinations of student well-being in school by teacher temperament type and teacher gender were not performed due to the low amount ( $n < 10$ ) of certain temperament type combinations in the female teacher sample.

## RESULTS

### Descriptive Statistics

Examination of the mean scores of the EATQ-R (Table 1 on the next page) and the ATQ (Table 2 on the next page) subscales showed that Shyness, Frustration and Fearfulness were the least endorsed traits among students, while Attention, Affiliation and Inhibitory control were endorsed the most. Similarly, teachers endorsed Frustration, Fearfulness and Discomfort the least and were most likely to endorse Positive affect, Sociability and Activation control. The mean school well-being scores by student temperament type and gender can be found in Table 5 on page 25.

### Gender Differences in the Temperament Sub- and Superscales

Possible gender differences in the mean temperament sub- and superscale scores of the students and the teachers were examined using independent samples *t*-tests, which resulted in several differences being found. Girls were higher than boys in Negative affectivity (Frustration) ( $t(575)=3.22, p < 0.01$ ), Fearfulness ( $t(575)=8.99, p < 0.001$ ) and Shyness ( $t(575)=4.99, p < 0.001$ ), but also in Affiliation ( $t(575)=9.26, p < 0.001$ ) and Pleasure sensitivity ( $t(575)=9.32, p < 0.001$ ). These differences in subscale scores further resulted in girls being higher than boys in the superscale of Affiliativeness ( $t(575)=8.03, p < 0.001$ ), while boys were higher than girls in Surgency ( $t(575)=-6.83, p < 0.001$ ). The opposite was true for the teachers: women were higher in Surgency than men ( $t(38)=3.85, p < 0.001$ ), a result of women also reporting higher scores in Positive affect ( $t(38)=3.07, p < 0.01$ ) and Sociability ( $t(38)=2.47, p < 0.05$ ). Additionally, women's scores were higher in Affective perceptual sensitivity ( $t(38)=2.47, p < 0.05$ ) and Neutral perceptual sensitivity ( $t(38)=2.39, p < 0.05$ ), resulting in women also having significantly higher scores in Orienting sensitivity ( $t(38)=2.69, p < 0.05$ ). On the other hand, male teachers had higher scores than women in the subscale of High-intensity pleasure ( $t(38)= -2.28, p < 0.05$ ).

TABLE 1. Descriptive statistics and reliability of the Early Adolescent Temperament Questionnaire - Revised (n = 577, 255 boys and 322 girls)

EATQ-R Super- and subscales	Total sample M (SD) <sup>a</sup>	Boys M (SD) <sup>a</sup>	Girls M (SD) <sup>a</sup>	Original scale $\alpha$	Final scale $\alpha^a$	Original scale AIC	Final scale AIC <sup>a</sup>
<b>Effortful control</b>	3.53 (0.52)	3.52 (0.50)	3.53 (0.54)	0.70 [3]	0.72 [3]	0.46	0.47
Activation control	3.38 (0.75)	3.35 (0.73)	3.41 (0.76)	0.71 [5]	0.71 [5]	0.33	0.33
Attention	3.65 (0.57)	3.67 (0.57)	3.63 (0.57)	0.57 [8]	0.63 [5]	0.15	0.26
Inhibitory control	3.54 (0.62)	3.53 (0.61)	3.56 (0.64)	0.45 [5]	0.44 [4]	0.14	0.17
<b>Negative affect</b>	2.89 (0.69)	2.79 (0.67)	2.98 (0.69) *	0.78 [1]	0.78 [1]	0.30	0.30
Frustration	2.89 (0.69)	2.79 (0.67)	2.98 (0.69) *	0.78 [8]	0.78 [8]	0.30	0.30
<b>Surgency<sup>b</sup></b>	3.23 (0.55)	3.40 (0.49) *	3.10 (0.55)	0.47 [3]	0.47 [3]	0.23	0.23
Fearfulness	3.02 (0.70)	2.74 (0.66)	3.24 (0.65) *	0.61 [6]	0.61 [6]	0.21	0.21
High intensity pleasure	3.08 (0.70)	3.10 (0.68)	3.07 (0.72)	0.59 [7]	0.59 [7]	0.17	0.17
Shyness	2.36 (0.94)	2.15 (0.84)	2.53 (0.98) *	0.80 [4]	0.80 [4]	0.49	0.49
<b>Affiliativeness</b>	3.42 (0.58)	3.21 (0.57)	3.58 (0.53) *	0.57 [3]	0.57 [3]	0.30	0.30
Affiliation	3.64 (0.71)	3.36 (0.71)	3.87 (0.62) *	0.71 [5]	0.71 [5]	0.33	0.33
Perceptual sensitivity	3.42 (0.72)	3.46 (0.72)	3.50 (0.88)	0.71 [4]	0.71 [4]	0.38	0.38
Pleasure sensitivity	3.20 (0.93)	2.82 (0.84)	3.39 (0.69) *	0.82 [5]	0.82 [5]	0.48	0.48

<sup>a</sup> Calculated after removing items with item-total scale correlations below 0.20. Number of items per scale is given in parentheses.

<sup>b</sup> Calculated after reverse coding Fearfulness and Shyness.

\* Significant gender difference (higher) ( $p < 0.05$ )

TABLE 2. Descriptive statistics and reliability of the Adult Temperament Questionnaire (n = 40, 22 men and 18 women)

ATQ Super- and subscales	Total sample M (SD) <sup>a</sup>	Men M (SD) <sup>a</sup>	Women M (SD) <sup>a</sup>	Original scale $\alpha$	Final scale $\alpha^a$	Original scale AIC	Final scale AIC <sup>a</sup>
<b>Effortful control</b>	4.76 (0.69)	4.65 (0.72)	4.90 (0.65)	0.53 [3]	0.57 [3]	0.28	0.32
Activation control	5.00 (0.88)	4.80 (0.92)	5.26 (0.79)	0.52 [7]	0.69 [5]	0.14	0.31
Attention	4.54 (0.89)	4.52 (0.97)	4.57 (0.82)	0.75 [5]	0.75 [5]	0.38	0.38
Inhibitory control	4.74 (1.06)	4.64 (0.97)	4.88 (1.18)	0.50 [7]	0.66 [4]	0.13	0.33
<b>Negative affect</b>	3.67 (0.67)	3.52 (0.67)	3.85 (0.64)	0.61 [4]	0.58 [4]	0.29	0.28
Discomfort	3.82 (1.21)	3.52 (1.17)	4.19 (1.19)	0.76 [6]	0.81 [5]	0.33	0.45
Fearfulness	3.40 (0.89)	3.29 (1.03)	3.54 (0.69)	0.63 [7]	0.64 [6]	0.20	0.23
Frustration	3.18 (0.93)	3.11 (0.91)	3.25 (0.98)	0.75 [6]	0.75 [6]	0.35	0.35
Sadness	4.28 (0.98)	4.17 (1.05)	4.41 (0.89)	0.75 [7]	0.75 [7]	0.30	0.30
<b>Surgency</b>	5.27 (0.73) <sup>b</sup>	4.92 (0.56) <sup>b</sup>	5.69 (0.71) <sup>b</sup> *	0.27 [3]	0.32 [2] <sup>b</sup>	0.11	0.19 <sup>b</sup>
High intensity pleasure	3.65 (1.02)	3.97 (1.14) *	3.27 (0.70)	0.62 [7]	0.63 [6]	0.19	0.23
Positive affect	5.33 (0.95)	4.95 (0.95)	5.79 (0.74) *	0.80 [5]	0.80 [5]	0.46	0.46
Sociability	5.21 (0.95)	4.89 (0.73)	5.59 (1.06) *	0.69 [5]	0.69 [5]	0.32	0.32
<b>Orienting sensitivity</b>	4.53 (0.71)	4.28 (0.72)	4.84 (0.58) *	0.59 [3]	0.59 [3]	0.31	0.33
Affective perceptual sensitivity	4.60 (0.86)	4.31 (0.92)	4.94 (0.64) *	0.61 [5]	0.61 [5]	0.32	0.32
Associative sensitivity	4.79 (1.06)	4.63 (1.14)	5.00 (0.93)	0.60 [5]	0.62 [4]	0.24	0.31
Neutral perceptual sensitivity	4.20 (0.96)	3.89 (0.78)	4.58 (1.04) *	0.42 [5]	0.60 [4]	0.10	0.28

<sup>a</sup> Calculated after removing items with item-total scale correlations below 0.20. Number of items per scale are given in parentheses.

<sup>b</sup> Computed without the High-intensity pleasure subscale

\* Significant gender difference (higher) ( $p < 0.05$ )

## Temperament Types Among the Students and the Teachers

In order to study whether student and teacher temperament dimension (superscale) scores could be used to extract theoretically meaningful profiles representing the three RUO temperament types (Resilient, Undercontrolled and Overcontrolled, see Donellan & Robins, 2010), a *k*-means cluster analysis was performed. The temperament superscale scores were first standardized and then screened for outliers, which were then recoded to be within two standard deviations of the mean. This was done to ensure that differences in the means and standard deviations of the temperament superscales were controlled and that the effects of outliers were minimized in forming the clusters.

Clustering solutions using three (Effortful control, Negative affectivity, and Surgency) and four (Effortful control, Negative affectivity, Surgency, and Affiliativeness/Orienting sensitivity) temperament superscales were computed and compared, separately for the student and teacher samples. Solutions using the three common superscales were found to be more theoretically meaningful and readily interpretable, thus the Affiliativeness and Orienting sensitivity superscales were not used in forming the final clusters. The *k*-means cluster analysis identified three temperament types for students (see Figure 1 and Table 3) and teachers (see Figure 2 and Table 4). The reliability of both cluster solutions was confirmed by statistically significant agreement ( $p < 0.01$ ) in cross-validation (Kappa) between two randomly divided cluster solutions (cf. Breckenridge, 2000; Mandara, 2003).

FIGURE 1. Final cluster centers of *k*-means cluster analysis on standardized EATQ-R superscale scores ( $n = 577$ )

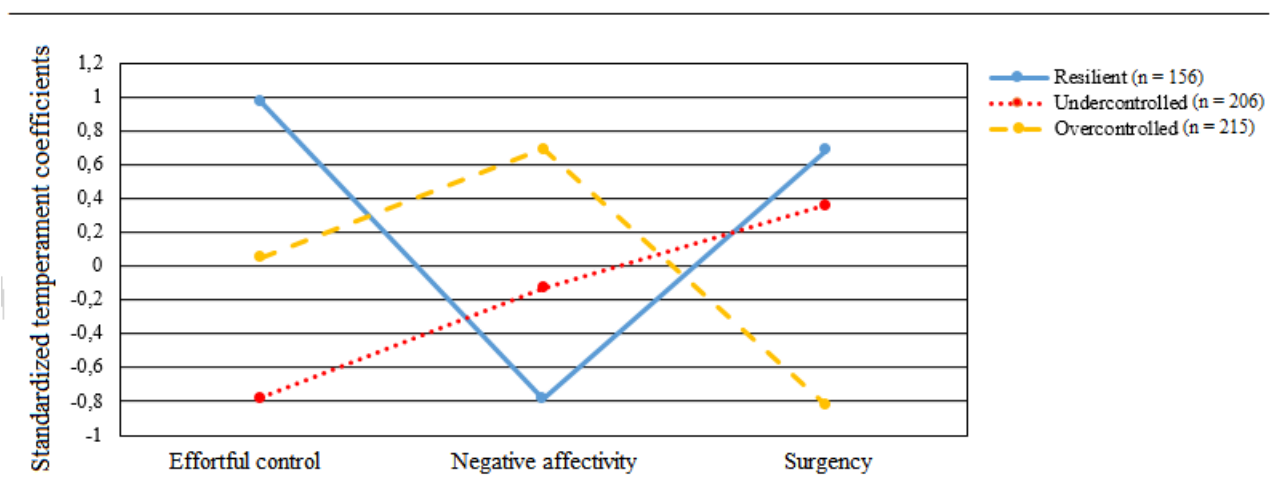


TABLE 3. Final cluster centers of *k*-means cluster analysis on standardized EATQ-R superscale scores (n = 577)

	Cluster		
	Resilient (n = 156)	Undercontrolled (n = 206)	Overcontrolled (n = 215)
Effortful control	0.97	-0.78	0.05
Negative affectivity	-0.79	-0.13	0.69
Surgency	0.68	0.36	-0.82

Students in the first cluster, labelled *Resilient* (n = 156, 71 girls), were characterized by above average levels of Effortful control and Surgency, and a below average level of Negative affectivity. The second cluster of students, *Undercontrolled* (n = 206, 102 girls), was characterized by an above average level of Surgency, a below average level of Effortful control, and an average level of Negative affectivity. Finally, the third cluster, labelled *Overcontrolled* (n = 215, 149 girls) contained students who were average in Effortful control, above average in Negative affectivity, and below average in Surgency.

FIGURE 2. Final cluster centers of *k*-means cluster analysis on standardized ATQ superscale scores (n = 40)

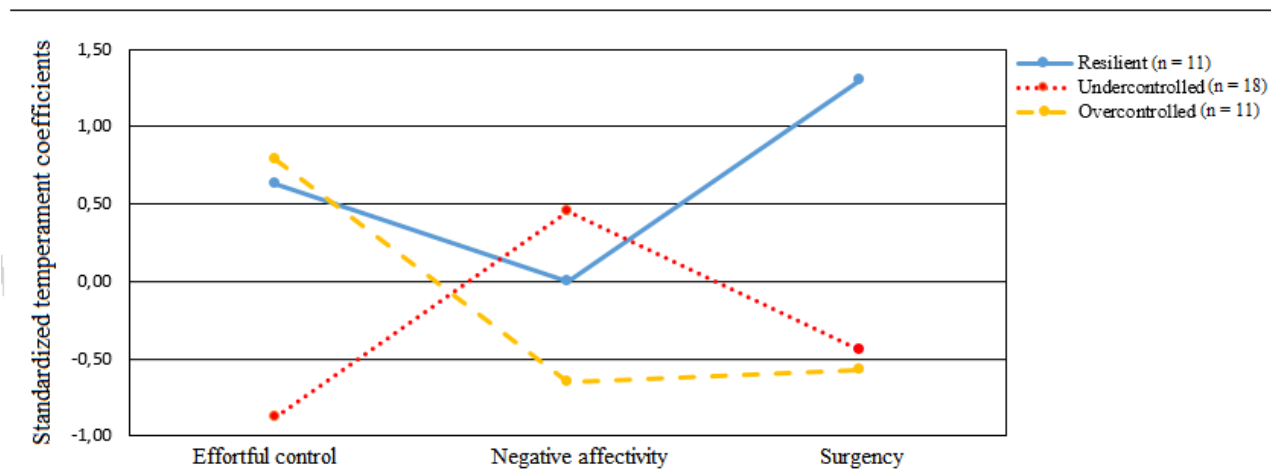


TABLE 4. Final cluster centers of *k*-means cluster analysis on standardized ATQ superscale scores (n = 40)

	Cluster		
	Resilient (n = 11)	Undercontrolled (n = 18)	Overcontrolled (n = 11)
Effortful control	0.63	-0.88	0.79
Negative affectivity	-0.08	0.45	-0.65
Surgency	1.30	-0.44	-0.57

In the teacher sample, the first cluster, *Resilient* (n = 11, 9 women), consisted of teachers who were above average in Effortful control, well above average in Surgency, and average in Negative affectivity. The second cluster, *Undercontrolled* (n = 18, 6 women), included teachers low in Effortful control and Surgency, and high in Negative affectivity. Lastly, the third cluster, named *Overcontrolled* (n = 11, 3 women), contained teachers high in Effortful control and low in Negative affectivity and Surgency.

As additional analyses, a chi-square test of independence and Fisher's exact test were used to see if there was a relation between the gender and the temperament type of the students and the teachers. A significant relation between gender and temperament type was found. Among students, girls were overrepresented in the Overcontrolled temperament type group ( $\chi^2(2, N = 577) = 25.89, p < .001$ ). For teachers, Fisher's exact test was used due to the small sample size. The test was significant ( $p < 0.05$ ), with more women exhibiting the Resilient type than men and more men exhibiting the Overcontrolled type than women.

### Student Temperament Type, Student Gender, and Well-being in School

Possible differences in the school well-being of students based on their RUO temperament type were examined using a one-way ANOVA, which resulted in statistically significant differences being found ( $F(2, 574) = 45.30, p < 0.001$ ). A Tukey's HSD post-hoc test showed that Undercontrolled students reported significantly lower well-being compared to Overcontrolled ( $p < 0.001$ ) and Resilient ( $p < 0.001$ ) students. Furthermore, students exhibiting the Resilient temperament type reported higher well-being than students exhibiting the Overcontrolled type ( $p < 0.001$ ) (See Table 5 for details). These differences persisted even after controlling for student academic skills (i.e., using



the mean of standardized scores from a math and a reading test as a covariate). The effect size of student temperament on well-being in school was of medium size (partial eta-squared  $\eta^2 = .129$ ).

TABLE 5. Student reported well-being in school by student temperament type and gender (n = 577, 255 boys and 322 girls)

Temperament type	n (Total / girls)	Total sample M (SD)	Boys M (SD)	Girls M (SD)
Overall sample	577 / 322	3.61 (0.73)	3.40 (0.76)	3.77 (0.67) *
Resilient	156 / 71	4.00 (0.64)	3.81 (0.67)	4.22 (0.54) *
Undercontrolled	206 / 102	3.31 (0.69)	3.10 (0.68)	3.52 (0.64) *
Overcontrolled	215 / 149	3.61 (0.70)	3.34 (0.76)	3.72 (0.64) *

\* Significant gender difference (higher) ( $p < 0.05$ )

Possible differences in well-being in school by student gender were examined first on the overall sample level and, as additional analyses, within each RUO temperament type group using independent samples *t*-tests. Girls reported higher well-being than boys both on the overall sample ( $t(575)=6.22, p < 0.001$ ) and within each of the RUO temperament type groups: Resilient ( $t(154)=4.17, p < 0.001$ ), Undercontrolled ( $t(204)=4.60, p < 0.001$ ) and Overcontrolled ( $t(213)=3.80, p < 0.001$ ).

Furthermore, differences in student well-being in school based on student temperament type and gender were analyzed using one-way ANOVAs. Significant differences were found between the RUO temperament type groups in both girls ( $F(2, 319) = 27.45, p < 0.001$ ) and boys ( $F(2, 252) = 24.70, p < 0.001$ ). Post-hoc comparisons with Tukey's HSD revealed that Undercontrolled girls reported lower well-being in school than Overcontrolled ( $p < 0.05$ ) and Resilient ( $p < 0.001$ ) girls. Additionally, Overcontrolled girls reported lower well-being in school than Resilient girls ( $p < 0.001$ ). For boys, however, the only difference was that Resilient boys reported higher well-being in school than boys in the other two groups ( $p < 0.001$ ). In other words, there was no significant difference in well-being in school between Undercontrolled and Overcontrolled boys ( $p = 0.069$ ) (See Table 5 for details). Again, all of these findings persisted after controlling for student academic skills.

Finally, since both student temperament type and student gender were significantly associated with student well-being in school, a two-way ANOVA was used to test for possible interaction between them. However, no statistically significant interaction was found between student temperament type and gender ( $F(2, 571) = 0.06, p = 0.946$ ).

## Teacher-Student Temperament Type Combinations and Student Well-being in School

In order to study the associations of different combinations of teacher and student temperament types with student well-being in school, each student's RUO type was first combined with their teacher's RUO type to form one of nine different temperament type combination (1 = Resilient child – Resilient teacher, 2 = Resilient child – Undercontrolled teacher, 3 = Resilient child – Overcontrolled teacher, 4 = Undercontrolled child – Resilient teacher, 5 = Undercontrolled child – Undercontrolled teacher, 6 = Undercontrolled child – Overcontrolled teacher, 7 = Overcontrolled child – Resilient teacher, 8 = Overcontrolled child – Undercontrolled teacher, 9 = Overcontrolled child – Overcontrolled teacher). The examination of the levels of student well-being in school between the combinations revealed a structure that was similar to earlier results: Resilient students reported the highest and Undercontrolled students the lowest well-being in school regardless of their teacher's temperament type (See Table 6 below for details).

TABLE 6. Student reported well-being in school by student-teacher temperament type combination and student gender (Students  $n = 577$ , 255 boys and 322 girls; Teachers  $n = 40$ , 22 men and 18 women)

Temperament type	n (Total / girls)	Total sample M (SD)	Boys M (SD)	Girls M (SD)
Resilient child – Resilient teacher	43 / 14	4.02 (0.63)	3.85 (0.64)	4.36 (0.45)
Resilient child – Undercontrolled teacher	72 / 36	4.01 (0.72)	3.76 (0.75)	4.25 (0.61)
Resilient child – Overcontrolled teacher	41 / 21	3.96 (0.51)	3.84 (0.56)	4.08 (0.43)
Overcontrolled child – Overcontrolled teacher	73 / 50	3.68 (0.68)	3.35 (0.79)	3.84 (0.57)
Overcontrolled child – Undercontrolled teacher	92 / 47	3.58 (0.70)	3.38 (0.74)	3.66 (0.66)
Overcontrolled child – Resilient teacher	50 / 35	3.55 (0.72)	3.27 (0.78)	3.67 (0.68)
Undercontrolled child – Overcontrolled teacher	62 / 24	3.38 (0.61)	3.19 (0.61)	3.68 (0.49)
Undercontrolled child – Undercontrolled teacher	90 / 47	3.32 (0.67)	3.14 (0.70)	3.47 (0.61)
Undercontrolled child – Resilient teacher	54 / 31	3.22 (0.81)	2.87 (0.74)	3.48 (0.77)

To ensure that the combinations of student and teacher temperament type played no role in student well-being in school, a one-way ANOVA was used to compare well-being in school between groups of students of the same RUO type, each taught by a teacher of one of the three RUO types. Non-significant results were obtained in the Resilient ( $F(2, 153) = 0.094, p = 0.910$ ), Undercontrolled ( $F(2, 203) = 0.814, p = 0.444$ ) and Overcontrolled ( $F(2, 212) = 0.712, p = 0.492$ ) student groups, therefore indicating that the temperament type of the teacher was not significantly associated with student well-being in school in any of the student temperament type groups.

As additional analyses, differences in well-being in school between the different teacher-student temperament type combinations were examined by student gender. Levene's test of homogeneity was significant for the sample of Resilient girls, therefore the Welch test was used instead of one-way

ANOVA. According to the Welch test, there were no significant differences in well-being in school between Resilient girls based on their teacher's temperament type ( $F(2, 36.32) = 1.881, p = 0.167$ ). Likewise, no significant differences were obtained for Resilient boys ( $F(2, 82) = 0.189, p = 0.828$ ). This was also the case for both Undercontrolled girls ( $F(2, 99) = 0.927, p = 0.399$ ) and boys ( $F(2, 101) = 1.809, p = 0.169$ ) as well as Overcontrolled girls ( $F(2, 146) = 1.243, p = 0.292$ ) and boys ( $F(2, 63) = 0.101, p = 0.904$ ). Examinations of student well-being in school by teacher temperament type and teacher gender were not performed due to low amount ( $n < 10$ ) of certain temperament type combinations in the female teacher sample. To summarize, it can be concluded that teacher temperament type was not significantly associated with student well-being in school in any of the student temperament type groups, even when examined by student gender.

## **DISCUSSION**

The results from the current study provide evidence of a moderately strong association between a student's temperament type and their school well-being in the last grade of Finnish primary school. On the overall sample level, students exhibiting the Resilient temperament type reported higher well-being in school than students exhibiting the Overcontrolled type, who in turn reported higher well-being in school than students exhibiting the Undercontrolled temperament type. These results persisted after controlling for students' academic skills.

Student gender was also associated with student well-being in school. Girls reported significantly higher well-being than boys on the overall sample level and also within each of the three RUO temperament type groups. Furthermore, Resilient girls reported higher well-being in school than Overcontrolled girls, who in turn reported higher well-being in school than Undercontrolled girls. Similarly, Resilient boys reported higher well-being in school than boys from the Undercontrolled and Overcontrolled groups, however, there were no significant differences in well-being in school between Overcontrolled and Undercontrolled boys. These findings, too, persisted after controlling for students' academic skills. The temperament type of the teacher, however, was not significantly related to the school well-being of students of either gender.

### **Gender Differences in Temperament**

The first aim of the present study was to examine possible gender differences in the temperaments of Finnish sixth-grade students and their teachers. The results obtained were mostly congruent with hypothesis 1a (see also Ellis, 2002; Ellis & Rothbart, 2001; Else-Quest et al., 2006) by showing that girls were higher than boys in Affiliativeness, whereas boys scored higher than girls in Surgency. However, the hypothesized gender difference in Effortful control (i.e., girls being higher than boys) did not emerge. This part of the hypothesis was based on a meta-analysis by Else-Quest and colleagues (2006), in which very large gender differences in Effortful Control were found. It should be noted, however, that this meta-analysis aggregated sub-dimensions (e.g., attention span, persistence, and distractibility) from three different temperament theories under the label of Effortful Control, which has likely influenced the result. Previous research made using purely the EATQ-R has shown, at best, trend level differences favoring girls in Effortful Control (Ellis, 2002). While the

present study made no assumptions regarding gender differences in Negative affectivity (Frustration), the results showed that girls reported significantly higher frustration than boys did. Maccoby (1990) suggest that these gender differences in adolescent temperament may be a result of early gender role socialization, where low-intensity activities (e.g., playing house) and high-intensity activities (e.g., rough-and-tumble play) are likely to be preferred for girls and boys, respectively. Overall, it can be said that hypothesis 1a was confirmed, apart from differences in Effortful Control.

To the author's knowledge, the present study is one of the first to examine gender differences in temperament using the EATQ-R in a relatively large and representative sample of Finnish adolescents. As such, the findings of this study not only replicate results obtained in previous research, but also provide valuable baseline information about the structure of temperament in Finnish adolescents, as measured by the EATQ-R, for use in future research related to this particular population.

Hypothesis 1b (see also Pulkkinen, Kokko & Rantanen, 2012; Wiltink, Vogelsang, & Beutel, 2006) was also partially confirmed: female teachers scored significantly higher than male teachers in Sociability (as well as Surgency) and Orienting Sensitivity, however, the expected difference in Negative affectivity (i.e., women being higher than men) was not found. It should be noted, nevertheless, that on the trend level female teachers scored higher on every subscale of Negative affectivity than their male colleagues, therefore, the non-significant result may be due to the small sample size ( $n = 40$  teachers) in this study. In sum, hypothesis 1b was confirmed fully for Sociability and Orienting sensitivity and on the trend level for Negative affectivity.

Despite its small teacher sample size, this study provides an important first look into the temperament qualities of Finnish primary school teachers currently in working life, since previous studies examining teacher temperament in Finland have only targeted those studying to become teachers (Keltikangas-Järvinen & Mullola, 2014; Niemiaho, 2015). All in all, the hypotheses regarding gender differences in temperament were fairly accurate, therefore replicating results obtained from previous research, while also providing important information about the temperaments of Finnish adolescents and teachers.

### **Temperament Types among Students and Their Teachers**

The second aim of the present study was to examine whether three types of temperament established in previous research, Resilient, Undercontrolled and Overcontrolled (see Donellan & Robins, 2010),

could be extracted from the temperament data of Finnish sixth-grade students and their teachers. As hypothesized, three clusters resembling the RUO types obtained in previous research were successfully extracted for both students and teachers, confirming hypothesis 2 (see Donellan & Robins, 2010; Komsu et al., 2006). Resilient students were high in Effortful control and Surgency, and low in Negative affectivity, whereas Undercontrolled students were high in Surgency, low in Effortful control, and reported an average level of Negative affectivity. Overcontrolled students were average level in Effortful control, high in Negative affectivity, and low in Surgency. In turn, Resilient teachers were high in Effortful control, very high in Surgency, and average in Negative affectivity, while Undercontrolled teachers were low in Effortful control and Surgency, and high in Negative affectivity. Overcontrolled teachers were high in Effortful control and low in Negative affectivity and Surgency. Additional analyses showed that female students were overrepresented in the Overcontrolled student group, while female teachers were overrepresented in the Resilient teacher group. Male teachers, on the other hand, formed the majority of the Overcontrolled teacher group.

Admittedly, some of the RUO type clusters turned out to be a little different from what was expected. For example, Overcontrolled students were higher than Undercontrolled students in Negative affectivity, while the opposite was expected. However, in this study Negative affectivity only encompassed the sub-dimension of Frustration (i.e., the negative affect related to interruption of ongoing tasks or goal blocking), which is likely to affect Overcontrolled students more than Undercontrolled students. It should also be noted that Overcontrolled students reported higher well-being in school than Undercontrolled students regardless of this difference. Nevertheless, future research should examine differences between the RUO temperament type groups in the EATQ-R's behavioral scales (Aggression and Depressive mood) in order to draw more definite conclusions.

Furthermore, there were also some unexpected patterns in the RUO types of the teachers: Overcontrolled teachers reported considerably lower Negative affectivity than Resilient teachers, and Undercontrolled teachers reporting low amounts of Surgency, similar to Overcontrolled teachers. It may be that Overcontrolled teachers may control their emotions more or that they do not experience strong negative emotions, while the reason for the latter finding may be that teachers as a group are generally high in Surgency to begin with, so Surgency is not as distinctive a factor as it is in the general population. All in all, it should be remembered that despite these differences, the RUO temperament types for both students and teachers were found to be very reliable in a cross-validation of the data (Kappa) between two randomly divided cluster solutions (cf. Breckenridge, 2000; Mandara, 2003).

While the RUO types have previously been used to examine student temperament in preschool, the present study is the first to use the RUO temperament types when examining adolescents in the

classroom context. The successful extraction and cross-validation of the RUO temperament types in this study thus breaks new ground and establishes the Resilient, Undercontrolled and Overcontrolled temperament types as valid conceptualizations of adolescent temperament, which can be used in future research to study the associations between adolescent temperament and other factors of interest.

### **Student Temperament Type, Gender, and Well-being in School**

The third aim of the present research was to study possible differences in school well-being based on student temperament type (Resilient, Undercontrolled or Overcontrolled) and gender. The results provided evidence of a moderately strong association between a student's temperament type and his or her well-being in school. Specifically, students with the Resilient temperament type reported higher well-being than their Overcontrolled and Undercontrolled peers, while Overcontrolled students reported higher well-being than Undercontrolled students, before and after controlling for students' academic skills. These findings thus confirmed hypothesis 3a (see Keogh, 2003; Vitiello et al., 2012).

These results suggest that student temperament remains an important factor related to student well-being in school even in early adolescence. The result showing that Resilient students reported the highest level of well-being in school is in accordance with the notion that the temperamental predispositions of students exhibiting the Resilient type (characterized by self-confidence, self-direction, emotional stability, and a positive orientation toward others) are likely to be in accordance with the expectations of the teacher and the classroom environment in general (Keltikangas-Järvinen & Mullola, 2014; Keogh, 2003), therefore resulting in goodness of fit (Keogh, 2003; LaBillois & Lagacé-Séguin, 2009). This goodness of fit, then, is likely to lead to more positive experiences for Resilient students (such as a closer relationship with the teacher), and positive development in the classroom (see Thomas & Chess, 1977). Similarly, the finding that Overcontrolled and Undercontrolled students reported lower levels of well-being in school than Resilient students is consistent with previous literature, which has shown that adolescents with the Undercontrolled and Overcontrolled temperament types are more likely to exhibit internalizing (Overcontrolled) and both internalizing and externalizing problem behaviors (Undercontrolled) (Klimstra et al., 2010; Robins et al., 1996). From the perspective of goodness of fit, it can be argued that the temperamental dispositions of both Overcontrolled students (seen as emotionally brittle, sensitive, introverted and tense) and Undercontrolled students (seen as stubborn, physically active, disobedient and impulsive)

are not likely to fit a teacher's expectations of desirable student behavior in his or her classroom (Keltikangas-Järvinen & Mullola, 2014; Keogh, 2003). This poor fit is, then, is related to the internalizing (e.g., anxiety and social withdrawal) and externalizing (e.g., aggression and disobedience) problem behaviors in students (Carey, 1998). Furthermore, both externalizing and internalizing problem behaviors in students are associated with more conflict and less closeness in the teacher-student relationship (Lipscomb, 2014; Nurmi, 2012) and are thus likely to lead to lower student well-being in school.

Furthermore, the results showed that student gender was associated with student well-being in school. Girls reported significantly higher well-being than boys on the overall sample level and within each of the RUO temperament type groups (Resilient, Undercontrolled and Overcontrolled). Thus hypothesis 3b was also confirmed (see Currie et al., 2012). Additional analyses also showed that the association between student temperament type and well-being in school in girls mirrored the results from the overall sample (i.e., Resilient girls reported the highest and Undercontrolled girls the lowest well-being in school). In boys, however, the only difference was that the Resilient group reported higher well-being than the two other groups (Undercontrolled and Overcontrolled). In other words, there were no differences in well-being in school between Undercontrolled and Overcontrolled boys. Possible interaction between student temperament type and gender was tested for, but no significant interaction was found. Therefore, these results suggest that student gender is related to student well-being in school in a way that is independent of the student's temperament type.

The results support the notion that teacher expectations may be different for students of different genders (partially due to gender stereotypes) and thus the same kind of behavior from students of different gender may evoke different responses from the teacher (Keltikangas-Järvinen & Mullola, 2014), for example, a teacher may encourage girls exhibiting behavior that matches their expectations for girls (e.g., working quietly and concentrating on their work), while not rewarding boys exhibiting the same kind of behavior. It may also be that boys are more likely to be disciplined than girls for the same kind of behavior (e.g., talking loudly) because boys are more likely to be seen as 'troublemakers'.

In sum, this study provides important new information about the relation between students' temperament and their well-being in school in early adolescence. Unlike previous studies, the current study uses distinct measures for student temperament and well-being in school, therefore providing a clearer picture of the associations between them. Furthermore, this study combines the goodness of fit perspective (Thomas & Chess, 1977) and the developmental model of temperament (Rothbart & Derryberry, 1981) in a way that allows for a contemporary theoretical perspective. Another strength of the current study is the use of a typological, person-center approach to temperament, which



simultaneously considers all major dimensions of temperament, that is, Effortful control, Negative affectivity, and Surgency instead of single, isolated temperament traits. An approach like this has rarely been applied in the school context (but see Vitiello et al., 2012), however, this is the first time the RUO types have been used to study adolescent well-being in school. Finally, using the students as informants of their own temperament and well-being in school brings the point of view and experiences of the students to the forefront of this research.

### **The Role of Teacher Temperament Type in Student Well-being in School**

The final aim of the present study was to examine whether the associations of student temperament type and gender with student well-being in school would be different depending on teacher temperament type. In contrast to hypothesis 4 (see Keogh, 2003), the results showed that the association between student temperament type and well-being in school were not different depending on teacher temperament type. Thus hypothesis 4 was rejected.

There are several possible explanations for this result. First of all, most adults have developed ways to control their innate temperament, that is, they can consciously act against their temperament predispositions, such as impulsivity (Keltikangas-Järvinen & Mullola, 2014). Teachers entering working life in Finland are relatively old (the youngest teacher participating in this study was 27 years old) due to a Master of Arts -degree in Education being a prerequisite to becoming a teacher in Finland. Taken together, this means that even freshly graduated teachers have likely had time to mature and find ways of controlling their temperamental predispositions (e.g., impulsivity). Additionally, the extensive education of the teachers has likely offered them better ways of handling possible conflicts with students instead of resorting to reactive behavior dictated by the teachers' negative temperamental predispositions (such as in the case of an Undercontrolled teacher reacting the behavior of an Undercontrolled student). In sum then, it can fortunately be said that teachers use their expertise, not their temperament, to teach (Keltikangas-Järvinen & Mullola, 2014).

Accordingly, it is likely that teachers' expectations for student behavior are influenced more by aspects such as attitudes, beliefs and values, rather than the teacher's temperament. This is congruent with research on the development of personality in adulthood (Rothbart & Bates, 2006) and indicates that the role of teacher temperament type in the goodness of fit with students may be diminished. It has also been suggested that teacher expectations are for the general class level and not specific to individuals (Martin, 2012; Seifer, 2000), which accordingly indicates that teachers make decisions

regarding their class based on what they consider to be the best for the class overall. This means that while a teacher's temperament type may make them more sensitive to the needs of students with a similar temperament type (e.g., an Overcontrolled teacher may better understand the anxiety felt by Overcontrolled student), this benefit is lost because decisions affecting the classroom are made on the terms of the majority of students.

While the results showed that there was no significant relation between the teacher and student temperament type combination, this study nevertheless adds to the scarce amount of literature examining the goodness of fit of teacher and student characteristics, which has hardly ever examined adolescents.

### **Limitations and Future Directions**

While the present study has strived to address weaknesses in previous research, it still has some limitations of its own that should be taken into account before drawing conclusions about its results. The greatest methodological limitation were the low Cronbach's alpha levels of certain EATQ-R and ATQ temperament sub- and superscales. In the EATQ-R, this refers to the subscales of Attention, Inhibitory control, and High-intensity pleasure, the reliability of which remained low despite efforts to pre-emptively and retroactively address this problem. However, it should be noted that this issue is not limited to the current study. Low reliability in the aforementioned EATQ-R subscales has also been reported in several previous studies (e.g., Chang, 2005; Ellis, 2002; Lemponen, 2011; Meriläinen & Rasinmäki, 2014; Muris & Meesters, 2009). Low reliability levels in the EATQ-R's Surgency and Affiliativeness superscales, on the other hand, may reflect sociocultural differences in the structure of temperament, as most of their subscales had acceptable alpha levels. This potential difference in the structure of temperament can arguably be attributed to the different socialization patterns in the cultures of Finland and the United States, where the EATQ-R was originally developed (see Ahadi et al., 1993). Future research should further examine the psychometric properties of the EATQ-R and the structure of temperament in the Finnish adolescent population. In contrast, the ATQ has already been successfully used in Finland (Pulkkinen, Kokko & Rantanen, 2012), so the low reliability levels in the superscales of the ATQ (i.e., Effortful control, Surgency, Negative affectivity and Orienting sensitivity) are likely to be caused by the relatively small size of the teacher sample ( $n = 40$ ).

A second methodological criticism may concern the use of the RUO types, as some may argue that they force individual temperament profiles to fit into three strict categories. While this is true, it has been argued that the RUO types provide a theoretically and empirically grounded way to account for within-person organization of personality, even if they do not clearly and unequivocally correspond to categorical distinctions among individuals (Donellan & Robins, 2010). Some criticism may also target decisions made in clustering the RUO types, such as the decision not to use the behavioral scales of the EATQ-R (i.e., Depressive mood and Aggression), which are often placed under the superscale of Negative affectivity, or the decision to exclude the Affiliativeness and Orienting Sensitivity superscales. While the current study did this in order to minimize the overlap between the scales measuring temperament and well-being in school and maximize the cluster solution reliability, future research could examine whether including the missing scales in the clustering process changes the structure and distribution of the RUO types. Additionally, it would be worth examining differences in the EATQ-R's behavioral scales (Aggression and Depressive mood) between the RUO temperament type groups in order to form a broader picture of their possible differences in social-emotional functioning (Ellis & Rothbart, 2001). It has also been suggested that the incremental validity of the RUO types is more compelling in longitudinal comparisons rather than in cross-sectional comparisons (such as this study) (Asendorpf, 2003), therefore future research in the *STAIRWAY*-study (Ahonen & Kiuru, 2013) should further examine the continuity and stability of the RUO types and their associations across the transition from primary school to secondary school.

Furthermore, while using the students as informants for both their temperament and well-being in school allows for examining their particular point of view, it is also a source of potential rater bias. It may be possible that low well-being due to, for example, depression may cause students to assess their temperament more negatively. The opposite is also possible, that is, students with high well-being may assess their temperament more favorably. In the future, it would definitely be worthwhile to compare students' self-evaluations of their temperament to evaluations made by their parents, and to examine whether possible differences between student and parent ratings have implications for the student's temperament type and the association between student temperament and well-being in school.

Finally, the scale used to measure student well-being in school in the current study, while high in reliability, could be further developed in order to ensure that it gives a valid and broad picture of student well-being in school. For example, a worthwhile addition may be items concerning how the students' right to participate is realized (e.g., "I feel that student voices are heard when making decisions related to school life"). Additionally, future research may benefit from having qualitative items added into the questionnaire (e.g., "The three most important things positively/negatively

affecting my well-being in school are...”), so that richer and more detailed data on the factors affecting student well-being in school can be obtained. Moreover, future research could examine the dimensions of school well-being (i.e., school satisfaction, schoolwork related stress and anti-school attitudes) separately for more detailed information. Finally, in the future, it may be worthwhile to attempt to control for the well-being of students outside the school context, so that more relevant conclusions can be made about aspects that are relevant to the students’ well-being specifically in the school and classroom contexts.

## **Conclusion**

The results of the present study suggest that the temperament type and gender of students are associated with their well-being in the last grade of Finnish primary school, while the temperament type of their teacher is not. These differences in student school well-being are not negligible, because they have been shown to have important implications for the students’ future health, welfare and academic success (Archambault, Janosz, Morizot, & Pagani, 2009; Fletcher, Bonell, & Hargreaves, 2008).

The current expectations of the classroom environment seem to favor Resilient students over Overcontrolled and Undercontrolled students, therefore making it harder for student with the latter two temperament types to achieve goodness of fit due to, for example, temperamental introversion and distractibility. Additionally, the expectations of the classroom environment seem to favor girls over boys. Because both student gender and temperament are biologically based (Rothbart and Derryberry, 1981) and relatively stable (in the sense that they cannot be easily changed by outside intervention), it is imperative that individual differences related to them are taken equally into account in the classroom. Therefore, in order to achieve goodness of fit with a broader scope of students, the classroom environment and its expectations should be altered in order to ensure that the classroom is a place that enables every student to reach their full potential.

According to Keogh and Speece (1996), three aspects are important to consider in regard to the goodness of fit between students and the classroom environment: 1) *the content and nature of the curriculum and modes of instruction*, 2) *the organization and management of space, time and resources*, and 3) *the nature of the interactions between students, peers and teachers*. This places the classroom teacher in a key role, since they are in a position to influence many of these aspects. With this in mind, a worthwhile first step in addressing problems in goodness of fit would be for teachers

to reflect on what kind of expectations they have for desirable student behavior and why. In other words, teachers ought to "know themselves", that is, to be aware of their own temperamental predispositions and attitudes that affect how they interact with their students. (Keogh, 2003). In specific, it might be beneficial for teachers to reflect on what they consider to be problematic student behavior, as it may turn out that these ideas may be based on preconceived attitudes on how students should learn and act in the classroom, which may have little to no connection on how the students actually succeed academically (Keltikangas-Järvinen & Mullola, 2014). For example, a teacher who expects students to show enthusiastic reactions and overt interest in the subject they teach might find the inhibited behavioral style of an Overcontrolled student unsatisfactory, even if they student is objectively good at and interested in the subject (Keltikangas-Järvinen & Mullola, 2014). Furthermore, teachers should be especially critical of their attitudes related to student gender in order to ensure that they don't treat student behavior differently based on student gender. The importance of teachers' self-knowledge should also be taken into account in teacher education in order to help future teachers to be more sensitive to the origins and effects of their expectations and attitudes related to student temperament and gender.

Secondly, as suggested by Keogh and Speece (1996), teachers can change the ways their classroom and teaching is organized. In practice, this can mean avoiding unnecessary, constant changes, and instead establishing safe daily routines, so that all students know what to expect from their day (Keltikangas-Järvinen, 2006). This can make things easier for Overcontrolled students, who may find it difficult to deal with rapid changes and uncertainty. Furthermore, having teachers utilize different methods of teaching may help in motivating students whose active learning style might not fit traditional teacher expectations (Keltikangas-Järvinen, 2006). This would likely be beneficial for Undercontrolled students. The participation of the students in deciding about these kinds of changes in the classroom environment should, however, be fundamental. This is because a recent study by Harinen and Halme (2012) found that the children's right to participate in making decisions about, for example, the contents or methods of their education is often not respected in Finnish elementary schools. Harinen and Halme (2012) further argue that not including the students in making these decisions may be one of the key reasons for low student well-being in school in Finland. Accordingly, necessary changes in relevant school policies should be made in order to allow students and teachers to work together to more freely re-organize their classrooms and its daily routines to fit their needs, therefore allowing for development towards a fair and equal classroom environment for all students regardless of their temperament type or gender.

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## **APPENDIX 1.** Changes made to the EATQ-R

### Items adapted from the parent report questionnaire by superscale and subscale

#### **Effortful control**

##### *Attention*

\* I am often in the middle of doing one thing and then go off to do something else without finishing it. (Reverse scored)

\* I finish what I start.

#### **Negative affectivity**

##### *Frustration*

\* I get very irritated when someone criticizes me.

#### **Surgency**

##### *High-intensity pleasure*

\* I think traveling to Africa or India would be exciting and fun.

#### **Behavioral scales (Not used in the current study)**

##### *Aggression*

\* I slam doors when I'm angry.

##### *Depressive mood*

\* Most days I am cheerful and in a good mood. (Reverse scored)

### Items replaced with items from the parental questionnaire by superscale and subscale

#### **Effortful control**

##### *Inhibitory control*

\* The more I try to stop myself from doing something I shouldn't, the more likely I am to do it. (Reverse scored) → It is easy for me to hold my laughter at inappropriate times.

### Subscale items removed due to low (< .20) inter-item correlation

##### *Attention*

\* I find it hard to shift gears when I go from one class to another at school. (Reverse coded)

\* When trying to study, I have difficulty tuning out background noise and concentrating. (Reverse coded)

\* I tend to get in the middle of one thing, then go off and do something else. (Reverse coded)

##### *Inhibitory Control*

\* It's hard for me not to open presents before I'm supposed to. (Reverse coded)

## **APPENDIX 2.** Changes made to the ATQ

### Subscale items removed due to low (< .20) inter-item correlation

#### *Activation Control*

- \* I am often late from meetings.
- \* I avoid situations where I can't be sure what happens next.

#### *Inhibitory Control*

- \* It's hard for me to resist food, drinks etc., which I crave.
- \* When I'm really excited about something, I often have trouble inhibiting my desire to start working immediately, not thinking about the possible consequences.
- \* When I see a tempting item in a store, it is often very hard for me not to buy it.

#### *Discomfort*

- \* I find screeching or scratching sounds extremely annoying.

#### *Fear*

- \* I become really anxious in small enclosed spaces, like elevators.

#### *High-intensity pleasure*

- \* When listening to music, I usually turn it up louder than others do.

#### *Associate sensitivity*

- \* When I am resting with my eyes closed, I begin to see different kinds of imagery

#### *Neutral perceptual sensitivity*

- \* I often notice the sounds of birds.