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Development and Aging

Associations of temperament types and gender of early adolescents and teachers with adolescents' school well-being

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Puonti, V., Hirvonen, R. & Kiuru, N. (2021). Associations of temperament types and gender of early adolescents and teachers with adolescents' school well-being. *Scandinavian Journal of Psychology*.

This study examined the role of temperament type and gender of adolescents and teachers in adolescents' well-being in school. The sample consisted of 677 Finnish students and 56 classroom teachers. Parents rated adolescent temperament and teachers rated their own temperament in autumn of Grade 6. Self-reports of school well-being among adolescents were obtained in autumn and the fall of Grade 6. The results showed that being a girl and having resilient temperament type predicted higher school well-being. In turn, boys with undercontrolled temperament, who were otherwise at risk for decreased school well-being, particularly benefited from having a female teacher with resilient temperament. Overall, the results suggest that both adolescent temperament type and gender play important roles in adolescents' well-being in school.

Key words: Adolescence, gender, goodness of fit, school well-being, temperament type.

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INTRODUCTION

Ill-being in adolescence is one of the biggest challenges of the new millennium (Navarrete, 1999), and as most adolescents spend a great deal of their time at school, the ways how they experience attending school and how they perceive classroom environment are not insignificant. For example, negative school experiences have been found to be linked to lower levels of adolescent well-being and increased risk of academic failure and dropping out (Archambault, Janosz, Morizot & Pagani, 2009; Randolph, Kangas & Ruokamo, 2010). Positive school experiences, in turn, are associated with higher levels of adolescent well-being and lower levels of risky health behaviors (e.g., drug abuse) (Fletcher, Bonell & Hargreaves, 2008). Individual differences in adolescents' responses to the classroom environment and their ways of interacting with it may be partly influenced by adolescent temperament (Keogh, 2003). Research on the goodness of fit between student temperament and the classroom environment, however, is thus far scarce (Al-Hendawi, 2013; Martin, 2011). Furthermore, only a few studies have examined the role of goodness of fit between teacher temperament and student temperament in student well-being (Lipscomb, Schmitt, Pratt, Acock & Pears, 2014). It has also been acknowledged that teachers' expectations may be different for boys and girls suggesting that same kind of behavior might evoke different reactions from the teacher depending on the student's gender (Mullola, Ravaja, Lipsanen *et al.*, 2012). Consequently, this study aimed to examine the extent to which adolescent temperament type and gender predict adolescent well-being in school and whether these associations are different depending on classroom teacher's temperament type and gender.

The developmental model of temperament

In the present study, temperament is conceptualized using the developmental model of Rothbart and Derryberry (1981; see also

Rothbart, 2011; Rothbart & Bates, 2006), 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). Conceptually, temperament is seen as part of a broader concept of personality, as a biological basis on which personality later develops (Derryberry & Rothbart, 1997; Rothbart, Ahadi & Evans, 2000). In addition to temperament, personality comprises an individual's beliefs of oneself and others, one's values, attitudes, and coping strategies (Rothbart & Bates, 2006).

Three major dimensions of temperament have been identified within Rothbart and Derryberry's (1981) developmental model: (1) *Effortful control*, which includes aspects such as inhibitory control and attentional focusing; (2) *Negative affectivity*, which consists of elements like fear and social discomfort; and (3) *Surgency/Extraversion*, which is composed of facets such as positive anticipation and sensation seeking (Posner & Rothbart, 2007; Rothbart & Bates, 2006). Two further dimensions, *Affiliativeness* and *Orienting sensitivity*, are thought to emerge in early adolescence (between the ages of 10 and 15; Ellis & Rothbart, 2001) and in adulthood (Rothbart *et al.*, 2000), respectively. Both consist of elements such as perceptual sensitivity and pleasure sensitivity. These 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).

Previous research has shown that temperamental negative affectivity increases the risk of internalizing symptoms (Elovainio, Kivimäki, Puttonen, Heponiemi, Pulkki & Keltikangas-Järvinen, 2004; Snyder, Gulley, Bijttebier *et al.*, 2015). Effortful control, in turn, seems to protect against stress, anxiety, and depressive symptoms (Muris, Meesters & Blijlevens, 2007; Snyder *et al.*, 2015). Some studies have shown that also temperamental inhibition (or low surgency/extraversion) is related to higher anxiety in the face of challenges (Hirvonen, Aunola, Alatupa, Viljaranta & Nurmi, 2013). Analyzing only separate temperament dimensions disregards the fact that temperament dimensions are often highly inter-correlated and, thus, does not provide knowledge about the organization of these dimensions within individuals (see also Hirvonen, Väänänen, Aunola, Ahonen & Kiuru, 2018). Understanding temperament as constellations of different temperament dimensions calls for a typological (i.e., person-centered) approach to temperament (Bergman, Magnusson & El-Khoury, 2003; Laursen & Hoff, 2006) which enables grouping individual by patterns of characteristics. The individual, after all, rather than their isolated traits, engages in dynamic transactions with their social environments (Donellan & Robins, 2010).

The resilient, undercontrolled, and overcontrolled temperament types

Research on the development of personality in the past 20 years has provided evidence of three distinct personality types that are replicable across time, statistical methods, and different cultures: resilient, undercontrolled, and overcontrolled (Alessandri, Vecchione, Donnellan, Eisenberg, Caprara & Ciecuch, 2014; Chapman & Goldberg, 2011; Donellan & Robins, 2010). In the present study, the acronym RUO is used to refer to these temperament types.

Individuals with the resilient temperament type are characterized by self-confidence, self-direction, emotional stability, and a positive orientation towards others (Donellan & Robins, 2010). The undercontrolled temperament type is generally defined by impulsivity, high extraversion, relatively low self-regulation, and unstable negative emotionality, while individuals with the overcontrolled temperament type tend to have relatively high amounts of negative emotionality, self-regulation, and introversion (e.g., Asendorpf, Borkenau, Ostendorf & Van Aken, 2001; van Leeuwen, de Fruyt & Mervielde, 2004). Gender differences have been observed in the distribution of the RUO types: adolescent boys tend to be overrepresented in the undercontrolled group, while adolescent girls usually form a significant majority of the overcontrolled group (Meeus, van de Schoot, Klimstra & Branje, 2011).

According to Rothbart (2011), it is possible to use the dimensions of temperament described in the developmental model (Rothbart & Derryberry, 1981) to form the RUO temperament types. Accordingly, Komsí and colleagues (2006) extracted the RUO types from temperament data from infants and children up to 5.5 years old: Resilient children showed high self-confidence, Surgency, and Effortful control (measured as the ability to

concentrate on tasks). Undercontrolled children showed high Surgency and Negative affectivity but low Effortful control, while Overcontrolled children showed low Surgency, high Effortful control, and were 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, Atkins & Fegley, 2003). For example, undercontrolled boys have been found to have lower school achievement, worse conduct, and more juvenile delinquency in comparison to overcontrolled and resilient boys (Robins, John, Caspi, Moffitt & Stouthamer-Loeber, 1996). Undercontrolled boys are also at greater risk of 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 higher risk of internalizing problems when compared to resilient boys (Robins *et al.*, 1996). Similar results were later found among adolescents of both genders (Klimstra, Hale, Raaijmakers, Branje & Meeus, 2010). These observed differences in adolescent behavior reflect, in part, the degree of fit between adolescent temperament and their environment, which is embodied in the concept of goodness of fit. However, little is known about differences between the RUO types in regards to development of well-being in the school context.

Goodness of fit in the classroom and adolescent well-being in school

The term goodness of fit was first defined by Thomas and 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 fit between the individual and the environment, positive development can occur, whereas a 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). It has previously 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 adolescents (in terms of satisfaction with different aspects of life, such as relationships with other people; Garcia, 2011; Viñas, González, Malo, García & Casas, 2014). Simultaneously exhibiting high Effortful Control and low Shyness (i.e., high Surgency) is considered indicative of the resilient temperament type (see also Komsí *et al.*, 2006), which has been found to be positively related to many important developmental outcomes (e.g., academic success and low interpersonal aggression; Asendorpf & van Aken, 1999), therefore suggesting that individuals with the resilient temperament type are likely to achieve a good fit with their environment. However, as far as we know less attention has been paid on the role of adolescent temperament and its goodness of fit with environmental demands in the classroom context.

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 their students' behavior, that is, what kinds of emotional and behavioral responses the teacher considers acceptable or desired in their classroom (Keogh, 2003; Lerner, 1983). The extent to which a student's temperament matches the teacher's expectations (i.e., the goodness of fit) has been shown to be related to the quality of the teacher–student relationship and, consequently, to elements such as teaching practices and grading (Koles, O'Connor & McCartney, 2009; Spilt & Koomen, 2009). The temperamental predispositions of students with resilient temperament (self-confidence, self-direction, emotional stability, and a positive orientation toward others) are likely to match the expectations of most teachers (Keogh, 2003), typically leading to a good fit (Keogh, 2003; LaBillois & Lagacé-Séguin, 2009), a closer relationship with the teacher, and increased well-being. Conversely, adolescents typified by overcontrolled (high Negative emotionality and low Extraversion) and undercontrolled (impulsivity, low self-regulation, and unstable Negative emotionality) temperaments are less likely to fit teachers' expectations for desirable student behavior in their classrooms (Keogh, 2003) and are more likely to have a poorer fit. This may increase the risk of internalizing or externalizing problem behavior (Carey, 1998), which can then lead to increased conflict and decreased closeness in adolescents' relationship with their teacher (Nurmi, 2012) and decreased well-being in school (Lipscomb *et al.*, 2014).

However, teacher expectations are also thought to be affected by the teacher's own temperamental characteristics. Therefore, it is suggested that teachers' temperament may make them more sensitive to the needs of some students (e.g., a more inhibited teacher may be more understanding of the shyness and inhibitions of a student with similar tendencies) while also making it more difficult to achieve a good fit with some students (e.g., a teacher and a student sharing an intensive and reactive temperament may find their relationship to be quite volatile; Keogh, 2003). Despite the suggested importance of teacher temperament in teacher–student relationships (Keogh, 2003), only a few prior empirical studies have examined the goodness of fit between teacher and student temperaments in these relationships. These studies (all conducted in kindergarten classrooms) found that failing to meet the teacher's expectations concerning children's temperament resulted in increased tension in the student–teacher relationships (see Martin, 2011). Furthermore, teacher temperament was found to interact with student temperament in terms of influencing teachers' perceptions of a child's adjustment to school, with more conservative and order-seeking teachers assessing children with difficult temperaments more harshly in comparison to assessments by more open and intuitive teachers (Scott, 2003). Additionally, a study by Vitiello, Moas, Henderson, Greenfield and Munis (2012) found that undercontrolled children made greater gains in math skills in classrooms with teachers who gave greater emotional support, while overcontrolled children made greater gains in math achievement in classrooms where they were provided with higher levels of instructional support.

Student and teacher gender and well-being in school

Prior research has found significant gender differences in adolescent well-being in school. For example, results from the World Health Organization's cross-national Health Behaviour in School-aged Children study have repeatedly shown that girls report liking school significantly more than boys (Currie, Roberts, Morgan *et al.*, 2004; Currie, Zanotti, C., Morgan *et al.*, 2012; Inchley, Currie, Young *et al.*, 2016). From a goodness of fit perspective, this difference may be explained by a greater likelihood of girls engaging in adaptive learning behaviors in the classroom, while boys are more likely to show disinterest and less desire to please the teachers (Mullola *et al.*, 2012; Schaefer, 2004). Interestingly, prior research has shown that receiving the necessary academic help at school is a stronger positive predictor of school well-being for boys than for girls (Løhre, Lydersen & Vatten, 2010; Løhre, Moksnes & Lillefjell, 2014). However, boys tend to perceive receiving less support from teachers in general (Bokhorst, Sumter & Westenberg, 2010), which may also partly explain the gender differences in student-perceived school well-being. On the other hand, when classroom behaviors are taken into account it has been shown that both boys and girls receive high rates of positive feedback from their teachers in response to appropriate classroom behavior and task engagement (Beaman, Wheldall & Kemp, 2006).

In popular discourse, it is occasionally suggested that boys might benefit more from being taught by male teachers than by female teachers because it is supposedly easier for male teachers to form and maintain relationships with boys. However, research has found little evidence of any benefit to students purely from being taught by a teacher of their own gender (Martin & Marsh, 2005; Randolph *et al.*, 2010; Sabbe & Aelterman, 2007; Spilt, Koomen & Jak, 2012). In a study by Spilt *et al.*, (2012), both male and female teachers reported more conflict with boys than with girls, and female teachers reported less close relationships with boys than with girls.

The present study

The present study attempts to overcome the limitations of previous research in several ways. First, when investigating associations of temperamental types of early adolescents and their teachers with adolescents' well-being in school, we utilized information collected from three different sources to avoid common-method bias (see also Podsakoff, MacKenzie & Podsakoff, 2012): parent ratings of adolescent temperament, teacher self-ratings of temperament, and adolescent self-ratings of well-being in school. In the present study, the term well-being is used to refer to adolescents' own subjective interpretation of how they experience school (in terms of school satisfaction, schoolwork-related stress, and anti-school attitudes), as opposed to equating adolescents' well-being in school with a lack of behavioral problems as perceived by parents or teachers. Second, using the goodness of fit perspective (Thomas & Chess, 1977) and the developmental model of temperament (Rothbart & Derryberry, 1981) allows for well-established theoretical perspectives to be taken on temperament and its associations with adolescents' well-being in school. Third, 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 different temperament dimensions within a person. This perspective calls for a person-oriented approach which enables the grouping of individuals on differences in the patterns of temperamental characteristics instead of examining individual characteristics in isolation (Magnusson & Stattin, 2006).

The objective of the present study was to examine the interactions between early adolescent and teacher temperament type and gender and their roles in adolescents' well-being in school. Our first aim was to examine the extent to which adolescent gender and temperament type predict the development of well-being during the sixth grade. We hypothesized that students with a resilient temperament type would report higher well-being in school due to their temperament characteristics generally facilitating goodness of fit with the classroom environment (Keogh, 2003; LaBillois & Lagacé-Séguin, 2009), while students with undercontrolled or overcontrolled temperament types would report lower levels of well-being in comparison to resilient students. Furthermore, undercontrolled students were expected to report especially low well-being due to the likely poor fit of their temperament with the classroom environment (Hypothesis 1a; see Keogh, 2003; Vitiello *et al.*, 2012). Additionally, it was expected that girls would report higher well-being in school than boys (Hypothesis 1b; see Currie *et al.*, 2012).

Our second aim was to study whether teacher temperament type and gender affects the associations between adolescent temperament type and gender and adolescent well-being in school while controlling for earlier levels of adolescent well-being. Based on the goodness of fit theory developed by Thomas and Chess (1977) and other theoretical (Keogh, 2003) and empirical (e.g., Vitiello *et al.*, 2012) literature, it was expected that adolescent temperament type and gender would have different kinds of effects on adolescents' well-being in school depending on teacher temperament but not on teacher gender. Students of teachers with temperament characteristics that facilitate students receiving appropriate academic help and emotional support and that minimize conflict in the teacher–student relationship (e.g., openness to differences and emotional availability) were expected to show higher well-being than other students (Løhre *et al.*, 2010, 2014; Spilt *et al.*, 2012; Hypothesis 2).

METHOD

Participants

The present study is part of a larger longitudinal study, the goal of which is to identify factors that support adolescents' learning, well-being in school, and successful transition from primary school to secondary school. This study focuses on examining the role of adolescents' and teachers' temperament types and gender in adolescents' school well-being during Grade 6, that is, before the critical transition to lower secondary school. Temperament of adolescents and their teachers was measured in the fall semester of Grade 6, whereas adolescent school well-being was measured in both fall and spring semesters of Grade 6. The relevant university ethics committee reviewed and approved the research plan for the longitudinal study. Written consent to participate was obtained from the students' parents and from the teachers before the beginning of the study.

The sample consisted of 875 adolescents (474 girls, 401 boys) between 10 and 14 years of age ($M = 12.3$ years, $SD = 4.8$ months). Most adolescents (96%) reported Finnish as their mother tongue, 2% spoke a language other than Finnish, and 2% reported being bilingual with Finnish and another language. The study sample was fairly representative of the general Finnish population (Official Statistics of Finland, 2015a, 2015b). More details concerning demographic information about the participating families can be found in Mauno, Hirvonen, and Kiuru (2018).

The classroom teachers of the participating students were also asked to participate in the study. In Finnish primary school, students spend most of their school days with one classroom teacher, who teaches them in almost every subject. One classroom teacher chose not to fill in the questionnaire. The remaining 56 teachers (28 women and 28 men) were between 21 and 61 years of age ($M = 44.2$ years, $SD = 9.4$ years). The most common degree held by the teachers was a Master's degree in educational science qualifying to serve as a classroom teacher (93%) and the majority of the teachers (61%) had more than 15 years of work experience. Most teachers had been working with their current class for either 1 or 2 years (28.6%) or 3 or 4 years (28.6%), while 23.2% had worked with their class for under a year and 19.6% had worked with their class for over 4 years.

Procedure

The data from adolescents and teachers were collected in schools on normal school days. The adolescents filled in questionnaires concerning their school well-being in the autumn and spring semesters of Grade 6. Teachers rated their own temperament in the autumn semester, and during the same period, parents rated adolescents' temperament through questionnaires that were mailed to the parents.

Measures

Adolescent temperament. Parents assessed their child's temperament using the Finnish version of the Early Adolescent Temperament Questionnaire – Revised (EATQ-R) parent report form (Capaldi & Rothbart, 1992; Ellis & Rothbart, 2001). The original parental questionnaire contains 62 statements on a five-point Likert scale (1=*almost never true*; 5=*almost always true*); however, due to poor reliability, one item was dropped from the Fear subscale ("Your child doesn't enjoy playing softball or baseball because s/he is afraid of the ball"; see also validation study in the Finnish sample, Kiuru, Hirvonen & Ahonen, 2019). The statements measure four broader temperamental dimensions: Effortful control, Negative affectivity, Surgency/extraversion, and Affiliativeness. The Affiliativeness dimension was not used in the present study because we wanted to focus on the three dimensions that are fairly identical between the adolescent scale and the adult scale that was used for teachers. Composite scores for the temperament dimensions were computed by averaging the scores across relevant items. The Cronbach's alpha reliabilities for the temperament dimensions were 0.90 for Effortful Control, 0.88 for Negative Affectivity, and 0.83 for Surgency/Extraversion. More detailed information on the validity of the EATQ-R in the present sample can be found in Kiuru *et al.*, (2019).

Teacher temperament. Teachers self-assessed their temperament using the Finnish version of the Adult Temperament Questionnaire (ATQ; Evans & Rothbart, 2007; Rothbart *et al.*, 2000), containing 77 on a seven-point Likert-type scale (1 = *fits me very poorly*; 7 = *fits me very well*). The statements measure four temperamental scales: effortful control, negative affectivity, surgency/extraversion, and orienting sensitivity. These scales further consist of subscales (activation control, attentional control, and inhibitory control for effortful control; fear, frustration, sadness, and discomfort for negative affectivity; sociability, high intensity pleasure, and positive affect for surgency/extraversion; and neutral perceptual sensitivity, affective perceptual sensitivity, and associative sensitivity for orienting sensitivity). The Orienting sensitivity subscale was not used in the present study for consistency with the adolescent temperament scale EATQ-R. Composite scores for the temperament dimensions were computed by averaging the scores across the relevant subscale items. The Cronbach's

alpha reliabilities for the dimensions were 0.72 for Effortful Control, 0.79 for Negative Affectivity, and 0.67 for Surgency/Extraversion.

Adolescent well-being in school. The self-report for adolescent well-being in school consisted of 10 items drawn from the Health Behavior in School-aged Children study (HBSC; Currie *et al.*, 2012). The questionnaire measured three dimensions of well-being in school: *School satisfaction* (3 items; e.g., “I enjoy going to school”), *Schoolwork-related stress* (3 items; e.g., “I have too much schoolwork”), and *Anti-school attitudes* (4 items; e.g., “I wish I didn’t have to go to school”). The students were asked to evaluate how much they agreed with each statement on a five-point Likert-type scale ($1 = \text{Completely disagree}$; $5 = \text{Completely agree}$). In the present study, a global score for school well-being was used instead of the distinct subscales. The composite score for well-being in school was obtained by first recoding reversed items and then averaging the ratings across all items. Cronbach’s alpha for the scale was 0.90 in the autumn semester and 0.89 in the spring semester.

Statistical analyses

The statistical analyses were performed using the IBM SPSS Statistics 24 software. First, to extract the three RUO temperament types (resilient, undercontrolled, and overcontrolled; see Donellan & Robins, 2010) from adolescent and teacher temperament data in the fall semester of Grade 6, we performed a series of *k*-means cluster analysis. The cluster solutions were confirmed via a cross-validation of the data (Breckenridge, 2000; Mandara, 2003) as follows. First the data were randomly divided into two smaller samples (Samples A and B), each containing approximately half of the original data. Second, a full cluster analysis was performed on the first sample (Sample A). Third, a full cluster analysis was performed on the remaining data (Sample B). Fourth, Sample B was classified into clusters according to the centroids derived from Sample A. Finally, an agreement was computed between the cluster solutions found in steps three and four using Cohen’s kappa.

Second, we used general linear modelling to investigate whether adolescent temperament type and adolescent gender predict adolescent well-being in school. The dependent variable was the score for adolescent well-being in school in the spring, while the adolescent well-being score in the autumn was added as a covariate to control for the effect of earlier well-being. Similarly, school class identification number was added as a random factor to control for differences between schools. In turn, adolescent temperament type and gender were investigated as fixed factors. We also tested for possible interactions between adolescent temperament type and gender on adolescent well-being in school. Levene’s test indicated that the statistical assumption of equality of variances was met: $F(162, 503) = 0.98$, $p = 0.56$. The residuals were also approximately normally distributed.

Finally, we used also general linear modelling to investigate whether teacher temperament type and teacher gender moderate the associations between adolescent temperament type and gender with adolescent well-being in school. In these analyses, the dependent variable was adolescent well-being in the spring, whereas well-being in the autumn was included as a covariate to control for the effect of earlier well-being. Similarly, school class identification number was added as a random factor to control for between-school differences. In turn, adolescent temperament type, adolescent gender, teacher temperament type, and teacher gender were investigated as fixed factors. Possible interactions of adolescent and teacher gender and temperament types on adolescent well-being in school in the spring semester were also tested for, while simultaneously controlling for well-being in the autumn semester. Levene’s test indicated that the statistical assumption of equality of variances was met: $F(257, 408) = 0.87$, $p = 0.88$. The residuals were also approximately normally distributed.

RESULTS

Descriptive statistics

Descriptive statistics of the study measures are presented in Table 1 and correlations between the variables are given in

Table 1. Descriptive statistics of the study measures

	Total ($n = 677$) M (SD)	Girls ($n = 372$) M (SD)	Boys ($n = 305$) M (SD)
Early adolescents			
Effortful control	3.60 (0.56)	3.69 (0.54)	3.48 (0.57)
Negative affectivity	2.29 (0.51)	2.26 (0.51)	2.32 (0.50)
Surgency/ Extraversion	3.46 (0.65)	3.42 (0.66)	3.52 (0.65)
School well-being, Autumn	3.57 (0.75)	3.75 (0.68)	3.36 (0.77)
School well-being, Spring	3.66 (0.69)	3.83 (0.62)	3.47 (0.72)
Teachers	Total ($n = 56$) M (SD)	Women ($n = 28$) M (SD)	Men ($n = 28$) M (SD)
Effortful control	4.87 (0.55)	4.93 (0.54)	4.81 (0.57)
Negative affectivity	3.62 (0.61)	3.75 (0.56)	3.50 (0.69)
Surgency/ Extraversion	4.71 (0.62)	4.91 (0.63)	4.50 (0.55)

Table 2. Gender differences in the mean scores of the temperament dimensions of adolescents and teachers were examined using independent-samples *t*-tests. In the adolescent sample, girls scored higher than boys in Effortful Control, $t(675) = 4.70$, $p < 0.001$, Cohen’s $d = 0.36$. There were no significant gender differences in Negative Affectivity or Surgency. In the teacher sample, women scored higher than men in Surgency, $t(54) = 2.537$, $p < 0.05$, Cohen’s $d = 0.69$; however, there were no significant gender differences in Effortful Control or Negative Affectivity.

Temperament types among the students and the teachers

To extract the three RUO temperament types (resilient, undercontrolled, and overcontrolled; see Donellan & Robins, 2010) from the adolescent and teacher temperament dimensions using *k*-means cluster analyses, the temperament scores were standardized. The *k*-means cluster analyses identified the three temperament types for students and teachers. The reliabilities of both cluster solutions were confirmed by statistically significant agreement ($p < 0.01$) in cross-validation (kappa) between two randomly divided cluster solutions (Breckenridge, 2000; Mandara, 2003).

Adolescents in the first cluster (see Fig. 1), which was labelled *Resilient* ($n = 275$), were characterized by above average levels of Effortful control and Surgency and a below average level of Negative affectivity. The second cluster of adolescents, named *Undercontrolled* ($n = 194$), was characterized by an above average level of Surgency, a well below average level of Effortful control, and a well above average level of Negative affectivity. Finally, the third cluster, labeled *Overcontrolled* ($n = 202$), contained adolescents who were average in Effortful control and Negative affectivity and well below average in Surgency. A significant relationship between gender and temperament type was found among the students, $\chi^2(2, N = 677) = 9.856$, $p < 0.01$, in that boys were slightly overrepresented in the undercontrolled

Table 2. Intercorrelations of the study measures

	1	2	3	4	5	6	7	8	9	10
Adolescents										
1. Gender ^a	–									
2. Effortful control	–0.18***	–								
3. Negative affectivity	0.05	–0.62***	–							
4. Surgency/Extraversion	0.07	0.04	–0.19***	–						
5. School well-being, Autumn	–0.26***	0.31***	–0.17***	0.01	–					
6. School well-being, Spring	–0.26***	0.31***	–0.19***	0.02	0.78***	–				
Teachers										
7. Gender ^a	–0.03	0.03	–0.03	–0.05	0.03	0.03	–			
8. Effortful control	0.11	–0.29	–0.10	–0.07	–0.06	0.02	–0.10	–		
9. Negative affectivity	–0.10	0.30	–0.27	–0.05	–0.09	–0.13	–0.33*	0.19	–	
10. Surgency/Extraversion	0.18	0.04	0.08	0.24	–0.27*	–0.15	–0.21	–0.50***	–0.17	–

Notes: $N = 677$.

^a1 = female; 2 = male.

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

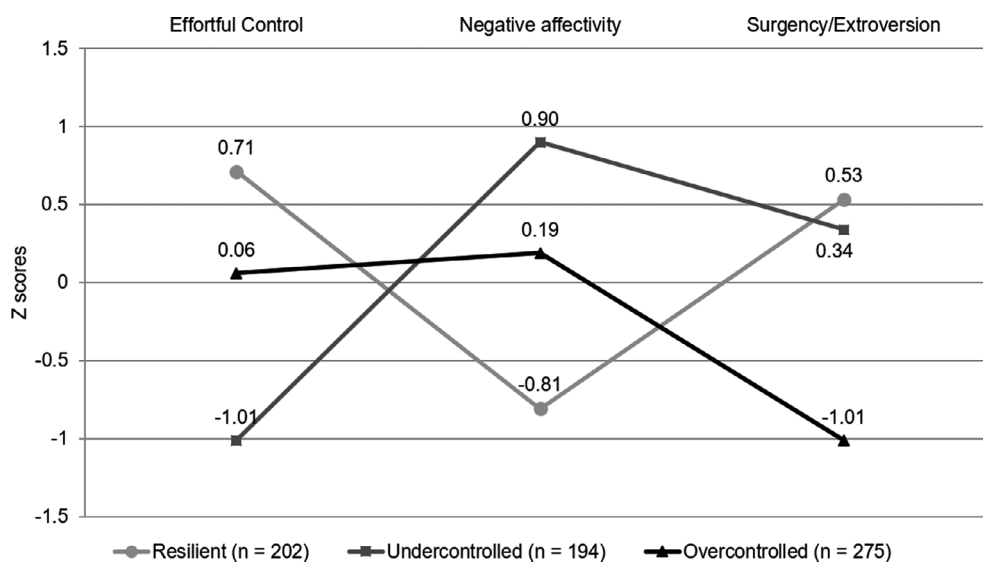


Fig. 1. Final cluster centers of the k-means cluster analysis for adolescents ($n = 671$).

group at the expense of girls (adjusted residual: -3.1). However, the association between gender and temperament type was small (Cohen, 1988), with Cramer's $V = 0.12$.

In the teacher sample (see Fig. 2), the first cluster, *Resilient* ($n = 14$), consisted of teachers who were average in Effortful control and Surgency and well below average in Negative affectivity. The second cluster, *Undercontrolled* ($n = 26$), included teachers below average in Effortful control and above average in Negative affectivity and Surgency. Finally, the third cluster, *Overcontrolled* ($n = 16$), contained teachers above average in Effortful control and Negative affectivity and well below average in Surgency. There was no significant association between gender and temperament type among the teachers, $\chi^2(2, N = 56) = 2.44, p = 0.18$. In the present sample, a total of 224 students had a resilient teacher, 428 students had an Undercontrolled teacher, and 223 students had an Overcontrolled teacher.

Adolescent well-being in school by temperament type and gender

Adolescents' school well-being in the autumn and spring semesters is presented in Table 3 by temperament type and gender. Table 4 shows the results of a general linear model for predicting adolescent well-being in school in the spring of Grade 6 by adolescent temperament type and gender after controlling for school well-being in the autumn of Grade 6. The results show, first, that well-being in the autumn semester significantly predicted adolescent well-being in the spring semester ($\beta = 0.67, s.e. = 0.03, p < 0.001$), suggesting that individual differences in adolescent well-being in school were relatively stable during Grade 6 between fall and spring. In turn, the results show that Adolescent Gender \times Temperament Type interaction did not significantly predict adolescent well-being in school in the spring of Grade 6. In other words, the effect of adolescent temperament type on school well-being was not different depending on

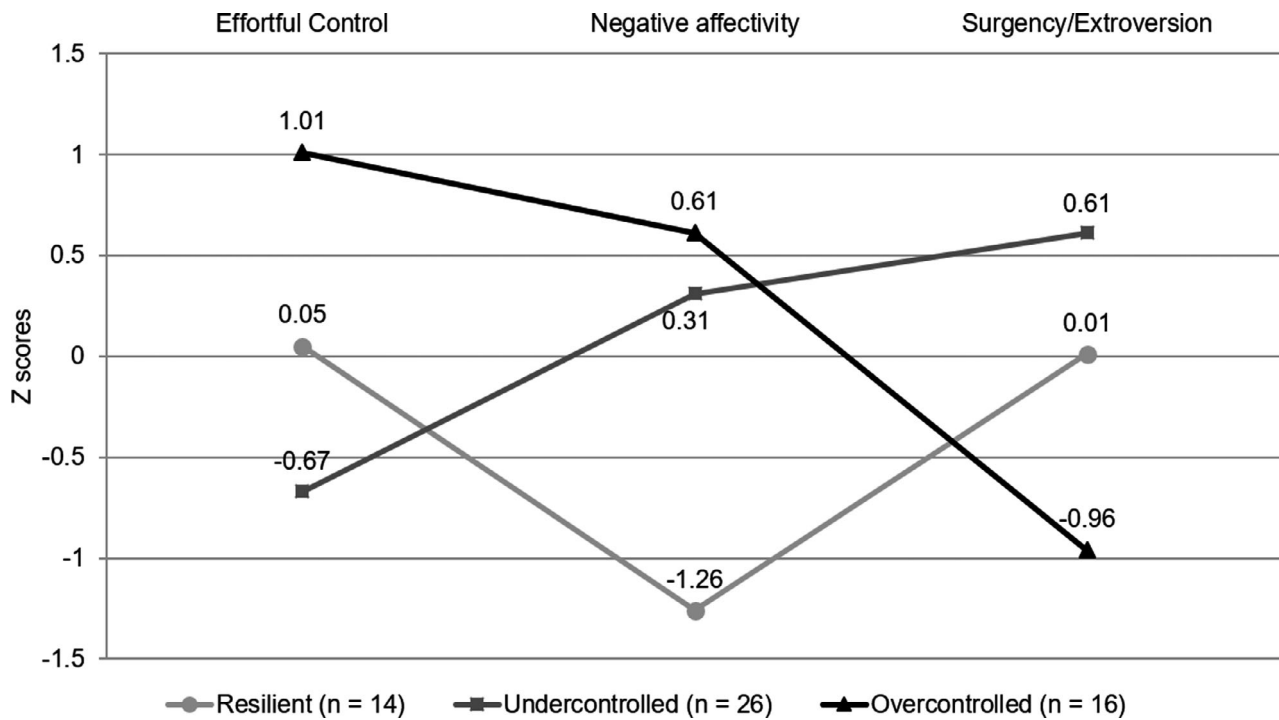


Fig. 2. Final cluster centers of the k-means cluster analysis for teachers (n = 56).

adolescent gender. Finally, the results showed that the main effects of both adolescent gender and temperament type on well-being in school were statistically significant: girls' well-being in school was higher than that of boys in the spring of Grade 6, even after controlling for school well-being in the fall of Grade 6 (see Table 3 for the means and standard deviations for girls and boys). Furthermore, paired contrasts showed that undercontrolled adolescents reported significantly lower well-being in spring of Grade 6 compared to resilient adolescents ($p = 0.011$), even after controlling for well-being in autumn of Grade 6 (see Table 3 for the means and standard deviations for different temperament types). The effect sizes of the effects of adolescent gender and temperament on adolescent well-being in school were nevertheless small.

Adolescent and teacher temperament type and gender in relation to adolescent well-being in school

General linear modeling was also used to examine whether teacher temperament type and gender moderate the associations

Table 3. Adolescents' school well-being in Autumn and Spring by temperament type and gender

	Resilient M (SD)	Undercontrolled M (SD)	Overcontrolled M (SD)
School well-being, Autumn			
Total	3.76 (0.68)	3.36 (0.70)	3.63 (0.71)
Girls	3.89 (0.65)	3.63 (0.63)	3.76 (0.67)
Boys	3.57 (0.69)	3.12 (0.67)	3.44 (0.73)
School well-being, Spring			
Total	3.86 (0.64)	3.45 (0.70)	3.73 (0.61)
Girls	4.00 (0.57)	3.69 (0.60)	3.82 (0.63)
Boys	3.66 (0.66)	3.25 (0.72)	3.58 (0.57)

Note: N = 875 total; n = 474 for girls; n = 401 for boys.

between adolescent temperament type and gender with adolescent well-being in school. The model included well-being in school in the autumn of Grade 6 as a covariate and a four-way-interaction of adolescent temperament, adolescent gender, teacher temperament, and teacher gender as well as all the lower-level terms (three-level interactions, two-level interactions, and main effects).

The results reveal a significant four-way interaction among Adolescent Temperament Type × Adolescent Gender × Teacher Temperament Type × Teacher Gender on adolescent well-being in school in the spring semester while controlling for well-being in the autumn semester, $F(4, 600) = 3.21, p = 0.05$, partial $\eta^2 = 0.015$. The follow-up analyses, carried out separately for adolescent girls and boys, showed that the three-way interaction Adolescent Temperament Type × Teacher Temperament Type × Teacher Gender on adolescents' school well-being in the spring of Grade 6 was significant for boys, $F(4, 297) = 3.50, p = 0.01$, partial $\eta^2 = 0.053$, but not for girls, $F(4, 321) = 0.39, p = 0.85$, partial $\eta^2 = 0.005$. For girls, only well-being in the fall of Grade 6 ($\beta = 0.70, s.e. = 0.03, p < 0.001$) and the girls' temperament type, $F(2, 321) = 3.25, p = 0.04$, partial $\eta^2 = 0.02$, significantly predicted well-being in the spring of Grade 6. Undercontrolled girls reported significantly lower well-being than resilient girls in the spring ($p = 0.043$), even after controlling for well-being in the autumn.

To further interpret the result for boys, we next investigated the effects of adolescent temperament and teacher temperament on boys' well-being separately for boys who had a female teacher and boys who had a male teacher. The results for boys with a female teacher showed that the two-way interaction Boys' Temperament Type × Teacher Temperament Type was significant, $F(4, 124) = 2.66, p = 0.036$, partial $\eta^2 = 0.079$, even after controlling for the effect of earlier well-being in school

Table 4. The results of general linear model for adolescent school well-being in the spring semester

	<i>F</i>	<i>df</i>	Partial η^2
Covariate			
School well-being, Autumn	701.49***	1, 630	0.53
Fixed factors			
Adolescent gender	3.82*	1, 630	0.01
Adolescent temperament type	4.64*	2, 630	0.02
Adolescent gender X temperament type	1.07	2, 630	0.00

Notes: $N = 666$. Differences between schools were controlled for in the analysis.

* $p < 0.05$; *** $p < 0.001$.

($\beta = 0.708$, *s.e.* = 0.05, $p < 0.001$). The main effects of adolescent temperament type, $F(2, 124) = 1.82$, $p = 0.166$, partial $\eta^2 = 0.029$, and teacher temperament type, $F(2, 124) = 0.002$, $p = 0.998$, partial $\eta^2 = 0.00$, were non-significant.

Figure 3 shows the interpretation of the significant interaction effect between boys' and female teachers' temperaments. When follow-up analyses were carried out separately for different female teacher temperament types, the main effect of adolescent temperament was largest for resilient teachers (partial $\eta^2 = 0.167$), second largest for undercontrolled teachers (partial $\eta^2 = 0.053$), and smallest for overcontrolled teachers (partial $\eta^2 = 0.010$). Pairwise comparisons indicated that undercontrolled boys with a resilient female teacher had higher well-being in school in the spring of Grade 6 compared to undercontrolled boys who had undercontrolled (Cohen's $d = 0.82$) or overcontrolled (Cohen's $d = 0.62$) female teachers. In addition, among boys taught by female teachers, well-being in autumn of Grade 6 predicted well-being in spring of Grade 6 ($\beta = .708$, *s.e.* = 0.054, $p < 0.001$).

Finally, the results for boys with a male teacher showed that the two-way interaction between boys' temperament type and teacher temperament was not significant, $F(4, 153) = 2.156$, $p = 0.077$, partial $\eta^2 = 0.053$. In other words, among boys with a male teacher, the effect of boys' temperament type on their well-being in school was not dependent on teacher temperament type. In turn, among boys taught by male teachers, the only significant predictors of boys' well-being in the spring of Grade 6 were their well-being in the autumn semester ($\beta = 0.632$, *s.e.* = 0.056, $p < 0.001$) and their own temperament type, $F(2, 153) = 4.352$, $p = 0.015$, partial $\eta^2 = 0.054$. Undercontrolled boys with male teachers reported lower well-being than resilient boys with male teachers ($p = 0.015$).

Additional analyses

Additional analyses were carried out by adding the level of parental education and students' academic skills as covariates in the general linear models. The results did not change after controlling for these factors.

DISCUSSION

The results of the present study revealed that early adolescents' gender and temperament type play an important role in adolescent

well-being in school. Girls reported significantly higher well-being than boys, and students with a resilient temperament type reported significantly higher well-being than students with an undercontrolled temperament type, even after controlling for the previous level of well-being. There were no significant differences in reported well-being between resilient and overcontrolled adolescents. Furthermore, the temperament type and gender of the classroom teacher were found to moderate the effect of adolescent temperament type on adolescent well-being in school for boys but not for girls. More specifically, undercontrolled boys reported significantly higher well-being when they were in a class taught by a resilient female teacher compared to undercontrolled boys with undercontrolled or overcontrolled female teachers. These findings, too, persisted after controlling for previous levels of well-being.

Adolescent temperament type and gender in relation to adolescent well-being in school

The first aim of the present study was to examine the extent to which early adolescent gender and temperament type predict the development of their well-being in school. The results were in line with Hypothesis 1a, showing that resilient adolescents reported higher well-being in school than their undercontrolled counterparts (see Keogh, 2003; Vitiello *et al.*, 2012). However, there was no significant difference between resilient and overcontrolled adolescents, although overcontrolled adolescents did report slightly lower well-being than resilient youth. The finding that undercontrolled adolescents reported the poorest well-being in school may partly reflect their temperamental predispositions, which may make them likely to act in ways that diverge from the expectations of teachers and peers (Carey, 1998). This, in turn, may lead to more frequent conflicts with the teacher and with peers, which may be experienced as lower school well-being.

Hypothesis 1b was also supported as the results showed that girls reported higher well-being in school than boys (see Currie *et al.*, 2012). This did not come as a surprise as this has been shown to be a recurring trend in large-scale international studies (Currie *et al.*, 2004, 2012; Inchley *et al.*, 2016). The result suggests that it might be easier for girls than for boys to achieve a good fit in the classroom environment and to enjoy going to school and doing schoolwork by implementing adaptive learning behaviors and conforming to teacher expectations (Schaefer, 2004).

The moderating effect of teacher temperament type and gender on boys' well-being in school

The second aim of the present study was to examine whether the longitudinal associations of adolescent temperament type and gender with adolescent well-being in school differed depending on classroom teacher's temperament type and gender. The results showed that teacher temperament and gender moderated the effect of undercontrolled boys' temperament type on their well-being in school: undercontrolled boys reported a higher level of well-being if they had a female classroom teacher with a resilient temperament type. This suggests that resilient female teachers

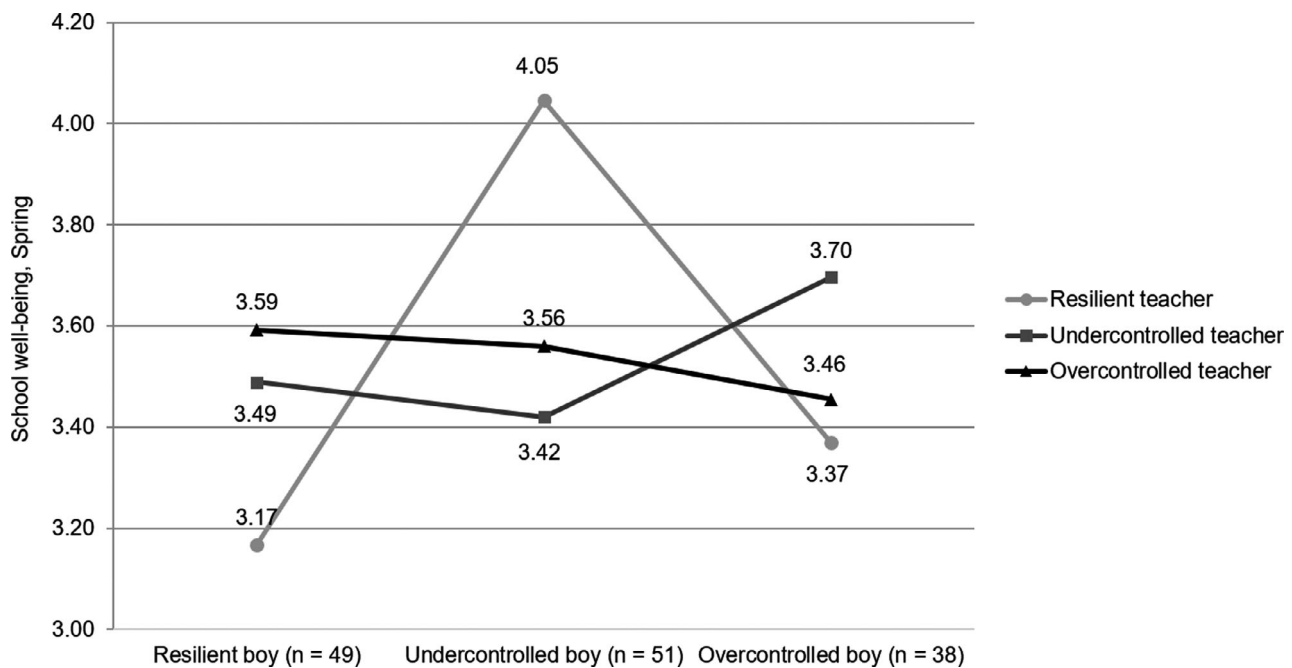


Fig. 3. The interaction effect of adolescent boys' temperament type and female teachers' temperament type on boys' well-being in school.

greatly facilitate the goodness of fit of undercontrolled boys with the classroom environment. One possible explanation is that resilient female teachers are more likely to have more tolerance for the temperamental predispositions of undercontrolled boys (e.g., impulsivity and low self-regulation) and to be more supportive and emotionally available to them in comparison to undercontrolled and overcontrolled teachers. However, more research is needed to more completely understand the interactions between the temperaments and genders of students and teachers.

Practical implications

According to Keogh and Speece (1996), three important aspects must be considered regarding the goodness of fit between students and their 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 classroom teachers in a key role as they are in a position to influence many of these factors. First, teachers should reflect on what kind of expectations they have for desirable student behavior and why they hold these expectations. In other words, teachers should be aware of their own temperamental predispositions and attitudes and how they affect the ways in which they interact with their students (Keogh, 2003). Furthermore, teachers should be especially critical of their attitudes related to student gender to ensure that they do not treat students exhibiting similar behavior differently based on the student's gender. The importance of teachers' self-knowledge should also be considered in teacher education to help future teachers be more sensitive to the origins and effects of their expectations and attitudes related to student temperament and gender.

Second, as suggested by Keogh and Speece (1996), teachers can change the ways their classroom and teaching are organized.

In practice, this can mean avoiding constant and unnecessary changes and instead establishing safe daily routines so that all students know what to expect from their day. This can make things easier for overcontrolled students, who may find it difficult to deal with rapid changes and uncertainty. Furthermore, utilizing different methods of teaching may help motivate students whose active learning style might not fit traditional teacher expectations (Oakland & Joyce, 2004). This would likely be beneficial for undercontrolled students. Participation of students in making decisions about their learning and the classroom environment should be fundamental; a recent study by UNICEF found that 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.

Limitations and future directions

This study has some limitations that should be considered before conclusions are drawn from the findings. The first limitation concerns the rather small teacher sample, which may have affected the results of the cluster analysis for temperament types among the teachers. Despite the relatively low number of teachers ($N = 56$) it is noteworthy that each teacher taught several students and that approximately 200–400 of the participating students were taught by teachers representing each different temperament type. This fact adds confidence in our findings, although there is an evident need to replicate the results with larger teacher samples. Similarly, as the teacher temperament types resembled the adolescents' types as well as the resilient, undercontrolled, and overcontrolled types found in previous studies (Donellan & Robins, 2010), the cluster solution can be considered trustworthy. Nevertheless, it is important to keep in mind when interpreting the distribution of the temperament types in the current sample that they represent the proportion of temperament types in the

studied teacher population. The results could be different if the original temperament scores were standardized according to the mean and standard deviation of a more heterogeneous adult population consisting of individuals from diverse occupational backgrounds.

Second, the present study was conducted among one specific age cohort in Finnish primary schools, where the students spend a substantial amount of their school days with the same teacher. Before generalizing the findings to other settings, more research is needed into other age groups and other educational systems. The final limitation relates to the relatively small effect sizes for the temperament type variables. However, when interpreting the effect sizes, it is notable that we controlled for previous levels of adolescent school well-being in the analyses and hence predicted change across time in a relatively stable level of school well-being. Although the effect sizes of the temperament types were not large, we believe that the obtained effects were nevertheless important, and the results have important educational implications. Future studies are called to examine how the goodness of fit of students' and their teachers' temperament also affects other outcomes, such as academic achievement and peer status in the classroom. In addition, it would be worthwhile to examine agreement between different raters of temperament, for example how convergent or divergent adolescents' and teachers' views of their temperaments are.

CONCLUSIONS

The results of the present study suggest that the temperament type and gender of early adolescent students predict their well-being in Finnish primary schools, while the effects of teacher temperament type and gender more specifically moderate the effect of undercontrolled adolescent boys' temperament type on their well-being in school. These differences in school well-being among students are not negligible: they have been shown to have important implications for students' future health, welfare, and academic success (Archambault *et al.*, 2009; Fletcher *et al.*, 2008). The current expectations of the classroom environment seem to favor resilient students and disadvantage the predispositions of undercontrolled students, therefore making it harder for students with an undercontrolled temperament type to achieve goodness of fit with their learning environment. Additionally, the expectations of the classroom environment seem to favor girls over boys. Because both student gender and temperament are biologically based (Rothbart & Derryberry, 1981) and relatively stable (in the sense that they cannot be easily changed from the outside), 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 for a broader range of students, classroom environments and expectations should be altered to ensure that the classroom is a place that enables every student to reach their full potential.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

DATA AVAILABILITY STATEMENT

The datasets generated and/or analyzed during the current study are not publicly available but are available from the corresponding author on reasonable request.

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