



This is a self-archived – parallel published version of an original article. This version may differ from the original in pagination and typographic details. When using please cite the original.

Taylor & Francis:

This is an Accepted Manuscript version of the following article, accepted for publication in:

JOURNAL                      Scandinavian Journal of Educational Research

CITATION                      Piia af Ursin, Tero Järvinen & Päivi Pihlaja (2021) The Role of Academic Buoyancy and Social Support in Mediating Associations Between Academic Stress and School Engagement in Finnish Primary School Children, Scandinavian Journal of Educational Research, 65:4, 661-675, DOI: 10.1080/00313831.2020.1739135

DOI                                10.1080/00313831.2020.1739135

It is deposited under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>) which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way.

**The role of academic buoyancy and social support in mediating associations between academic stress and school engagement in Finnish primary school children**

af Ursin, Piia<sup>a\*</sup>; Järvinen, Tero<sup>a</sup> and Pihlaja, Päivi<sup>a</sup>

<sup>a</sup> *Department of Education, University of Turku, Turku, Finland*

\* corresponding author

Piia af Ursin

e-mail: pkafur@utu.fi

## **Abstract**

School engagement is critical to learning and long-term academic success. Feeling overwhelmed with school demands form a threat to students' engagement. We examined the roles of person-internal (academic buoyancy) and person-external (social support) factors in mediating the association between academic stress and school engagement among primary school children in Finland. A sample of 403 children aged 8–9 years participated in this study. Analysis using structural equation modeling revealed that academic stress is negatively associated with engagement. The effect of academic stress on cognitive engagement was fully mediated by academic buoyancy and social support, whereas the effect on emotional engagement was partially mediated by these. Results suggest that supporting children's ability to deal with setbacks, providing social support, and promoting a socially supportive climate could be effective for the prevention of stress and its negative association with school engagement.

**Keywords:** academic stress, academic buoyancy, social support, school engagement, primary school

## **Introduction**

The present study identifies the ways person-internal (operationalized as academic buoyancy) and person-external (operationalized as perceived social support) factors account for school-related stress and its association with school engagement among Finnish primary school children. Robust body of research suggests that school engagement is essential to learning and academic success (Appleton et al., 2006; Fredricks et al., 2004; Ladd & Dinella, 2009; Pietarinen et al., 2014). Academic stress and anxiety, in turn, have been associated with lower levels of school engagement among adolescents (Martin, 2008; Salmela-Aro & Upadaya, 2014; Raufelder et al., 2014), linked to students' health complaints (Hjern et al., 2007; Karvonen et al., 2005), negatively associated with learning and academic performance (Collie, Ginns, et al., 2017; Kaplan et al., 2005), and contributing to school failure or even dropout (De Anda et al., 2000; Fredricks et al., 2004).

Students' capability to handle academic stress is decisive given how it displays in student outcomes (Lazarus & Folkman, 1984). Academic buoyancy, referring to a student's personal capacity to positively cope with academic challenges and setbacks typical for everyday school life, has been found central to influencing school engagement and mediating the effect of academic anxiety on engagement among high school students (Martin & Marsh, 2006, 2008a, 2009). Beside individual buoyancy, social support has proven to be a key element contributing to students' academic performance (Martin, Burns, et al., 2017) and school engagement (Skinner et al., 2008; You & Sharkey, 2009).

While numerous researchers have addressed the importance of the interplay between academic stress, school engagement, academic buoyancy and social support among adolescents, to our knowledge, not one study conducted so far has investigated these relationships among the youngest in primary school. Understanding children's academic stress appraisals, their ability to bounce back, and the mechanisms of how these effect school engagement is important to support successful academic pathways from early on

## **Academic Stress Among Children**

Challenge, setback, and difficulties in everyday school life range from difficult tasks to social conflicts in the school setting (Behnsen et al., 2018; Martin & Marsh, 2009; Sotardi, 2016). Apart from research on severe stressors arising from unusual and traumatic experiences, academic stress, that is, the “typical” stress (Martin & Marsh, 2008a, p. 55) that arises from keeping up with demands in school, is to a lesser extent examined on children (Compas et al., 2001; Lau, 2002).

In the first school years, children must learn to take responsibility in terms of academic tasks as well as to cooperate with peers and adults across diverse settings (Sotardi, 2016). The experiences of success or frustration in early school settings may have long-lasting positive or negative consequences (Eccles, 1999). Difficulties in keeping up with academic pressure or falling behind may ultimately lead to a decrease in academic self-competence and place the child on a less adaptive developmental trajectory (Compas et al., 2001). There are wide differences in individuals’ sensitivity and reactivity in handling stressful situations (Lazarus & Folkman, 1984), which calls for research on children’s self-reported experiences with academic stress.

In knowledge-based societies, a great emphasis is placed on academic achievement resulting in higher levels of stress being observed among students (Raufelder et al., 2014). As shown within the international Health Behaviour in School-Aged Children (HBSC) study, on average, a quarter of 11-year-olds, one-third of 13-year-olds, and almost every other 15-year-olds stated feeling pressured by schoolwork. Finnish students scored higher than the average in every age group. The perception of pressure increased with age. Further, while boys were more likely to report it at age 11, by the age 15, girls were more likely to do so. Especially encountered by the pressure were students with a middle-class background compared to those with lower socioeconomic status (SES) (Inchley et al., 2016).

## **Academic Stress in Relation to School Engagement**

Academic stress is of special interest to educational research because of its associations with academic performance (e.g., Skinner & Pitzer, 2012), including school engagement that underpins it (Martin, 2008; Raufelder et al., 2014). Students with

higher levels of stress tend to be less engaged in school. Respectively, a higher level of school engagement is associated with better academic performance, a lower likelihood of dropping out, and a higher likelihood of healthy emotional and social development (Fall & Roberts, 2012; Fredricks et al., 2004; Li, 2011; Wang et al., 2015).

According to in research most commonly applied conceptualization of the construct (see Eccles, 2016), engagement is a multi-dimensional construct that includes behavioral (participation in class and school), emotional (comprising dimensions of positive feelings about school and sense of belonging), and cognitive (comprising dimensions of motivation to learn and self-regulated learning strategies) components. These aspects capture the related but separately developing components of it, which mutually influence each other over time (Li & Lerner, 2013; Wang & Eccles, 2012a). However, the research evidence is still scarce and partly conflicting with regard the predictive interrelations among the components and their combined effect on academic achievement (Eccles, 2016; Li & Lerner, 2013; Pietarinen et al., 2014; Wang et al., 2015). While some studies suggested that emotional engagement contribute to cognitive engagement and lead, consequently, to a further increase in engaged behaviors and achievement (e.g., Pietarinen et al., 2014; Skinner et al., 2008), some have found both dimensions predicting behavioral engagement independently (e.g., Järvinen & Tikkanen, 2019), and some have revealed reciprocal, instead of a unidirectional, relationships between these (Li & Lerner, 2013). The evidence also shows that the educational and social environments may affect dimensions of engagement in different ways. While emotionally disengaged youth experienced a subsequent decline in academic achievement in America (Wang & Eccles, 2012a), in Finland, decline in academic performance was not associated with the decline in emotional engagement (Wang et al., 2015). Wang et al. (2015) conclude, that in Finland, students maintain relatively high levels of academic achievement despite feeling less emotionally engaged, if they are able to sustain a high level of behavioral and cognitive engagement. Further, among Finnish students, emotional engagement appears to affect academic performance through academic well-being.

The majority of engagement research has focused on the more observable indicators related to behavioral engagement, which have left the indicators of emotional and cognitive engagement to a lesser extent (Appleton et al., 2006; Fredricks et al., 2004).

However, it is exactly the latter components of engagement that form the basis for meaningful learning, since emotionally and cognitively engaged students are more willing to invest time and effort in their studies, are more likely to be efficient in dealing with study demands and display more persistence when facing problems than do their less engaged peers (Wang & Eccles, 2012b). Claiming the challenges of assessment and the lack of measures, the research on primary school children's cognitive engagement has been particularly scarce (Fredricks et al., 2004). However, while advanced forms of problem-solving may not emerge until late adolescence (Schneider & Pressley, 1997), students at the age of eight have been found capable of using a series of proactive coping strategies for academic stressors (Aspinwall & Taylor, 1997; Sotardi, 2016). Referring to research results about long-lasting influences of primary school engagement (Ladd & Dinella, 2009), its high level of interindividual stability (Skinner & Pitzer, 2012) and the trend of decreasing engagement by increasing age (Wang et al., 2015), more research among the youngest on the emotional and cognitive school engagement and their antecedents is warranted.

### **Handling Academic Stress: The Roles of Academic Buoyancy and Social Support**

Many studies have proven negative effects of stress on student outcomes, however, some have ended up with non-significant associations. The mixed findings point to the existence of other factors that may influence this effect (Collie, Ginns et al., 2017). In the resilience literature, these are called protective factors which diminish and change person's reactions to environmental threat and promote adjustment (Masten et al., 2009). In context of stress, academic buoyancy and social support may act as protective factors (e.g., Collie, Martin et al., 2017; Torsheim et al., 2003).

### **Academic Buoyancy**

The ability to cope with a wide range of challenges in everyday life is a key to personal well-being and development. In the academic domain, Martin and Marsh (2008a) conceptualize individual differences in dealing with school-related challenges as academic buoyancy. This is a relatively new construct grounded in the resilience literature, which offers an efficient and valid way to research students' adaptive, constructive and positive responses to the setbacks experienced in the routine course of everyday school life (Datu & Yuen, 2018). Compared to the related construct of

academic resilience, academic buoyancy focusses on lesser extreme and more temporary adversities in school life, such as experience of isolated poor performance (Martin & Marsh, 2009). Academic buoyancy is a concept near to that of emotional coping. However, while buoyancy refers to an appraisal of one's capacity to deal with setback, emotions relate to psychological processes that are experienced in response to e.g. a fearful or worrying event (Collie et al., 2015; Putwain et al., 2012). While the research on resilience have focused on the minority of students with acute or chronic adversities concerning their life events, such as trauma or disadvantaged homes, academic buoyancy allows studying the ability that every student needs when experiencing the everyday pressure and challenge of schoolwork (Hirvonen et al., 2019). Academic buoyancy has also demonstrated validity in measuring students' handling with daily academic hassles in various societies (Hirvonen et al., 2019; Martin, Yu, et al., 2017).

Keeping up with demands in school affects every student. When perceived that school demands exert one's prevailing abilities to respond to them, levels of academic stress increase. This may be the source of temporary dips in motivation and engagement (Collie, Ginns, et al., 2017; Martin & Marsh, 2008a). In a stressful situation, students equipped with high levels of academic buoyancy are supposed to be better able to deal with the stress (Martin & Marsh, 2008a). Thus, the speed with which students bounce back from stress experiences plays a crucial role in ongoing learning (Collie, Ginns, et al., 2017). This ability to bounce back has been found to be greater among boys compared to girls and among children with more educated parents in comparison to children with less-educated parents (e.g., Martin & Marsh, 2006, 2008a; Martin, Yu, et al., 2017).

Academic buoyancy has been positively associated with learning strategies, test achievement, and engagement factors such as self-efficacy, planning, and persistence (Collie, Ginns, et al., 2017; Martin, 2014; Martin, Yu, et al., 2017). With regard to academic adversities, it has been found to be negatively associated with anxiety (Martin & Marsh, 2006, 2008a; Collie, Ginns, et al., 2017), which is the adverse effect of academic stress referred to in the present study. Whereas most research on academic buoyancy has been important in studying predictors and consequences of buoyancy, it

has offered less explanations of how academic buoyancy in relation to both predictors and consequences may promote academic success (Datu & Yuen, 2018).

## **Social Support**

A central dimension supporting student's academic achievement is also the presence of supportive human relations. Related to academic stress, social support refers to interaction within one's social network in the way that helps individuals in finding solutions to academic problems in school. Successful students are likely to have supportive networks, experience low amounts of academic adversity, and remain academically buoyant when facing setbacks and challenges in school (Martin, 2013, 2014; Martin & Dowson, 2009; Martin et al., 2010, 2013; Collie, Martin, et al., 2017). Instead, students without an optimal level of social support are at greater risk of less adaptive educational outcomes when facing academic adversities (Collie, Martin, et al., 2017; Torsheim et al., 2003).

Building on the theories of social support (Cohen & Wills, 1985), educational research hypothesize that supportive relationships increase students' sense of competence, which is assumed to translate into higher confidence in school (Furrer & Skinner, 2003). Research on school engagement, in turn has identified multiple ways how supportive resources contribute to students' engagement. For instance, support enhances a student's academic motivation and mastery goal orientations, which are both closely linked to cognitive engagement (Wentzel, 1998). On the other hand, emotional interaction within the family, including students' feelings of satisfaction about being helped out in times of distress, and teacher and peer support were found to be of special importance in affecting student's emotional engagement and sense of school coherence (Skinner et al., 2008; Woolley & Grogan-Kaylor, 2006).

The family constitutes an emotional, social, and cognitive hub vital to children's full development and for their educational outcomes (Bourdieu, 1986; Woolley & Bowen, 2007; Woolley & Grogan-Kaylor, 2006). For example, supportive parents who are involved in student's education and family culture that highlight encouragement and educational aspirations, improve several school outcomes from school engagement to grades (Woolley & Grogan-Kaylor, 2006). However, regarding social support, families possess different amounts of resources such as skills and willingness to devote effort to

aiding children with school tasks and demands. This places children from disadvantaged homes in a less advantageous position (Bourdieu, 1986). Also, gender has been found central when examining children's perception of social support. While in a study by Wang and Eccles (2012b) there was no gender difference in social support perceived from parents, girls reported more support from teachers, classmates, and friends than boys did. Although girls and boys perceive different levels of support from different sources, support has been found to show similar and positive effects on academic adjustment for both genders.

The present study examines the role of academic buoyancy and social support in mediating the association between academic stress and school engagement. In detail, it is hypothesized that academic stress negatively associates with buoyancy, support and engagement factors and that the association between stress and engagement is mediated by buoyancy and support.

## **Method**

### **Research Context: Finnish Primary School**

Finnish children start their school career typically with a pre-primary school at the age of six. At the age of seven, they start compulsory nine-year comprehensive education. The highly standardized Finnish education system with a low level of stratification (e.g., Järvinen & Tikkanen, 2019) has been praised for its capability to promote educational equality. The principle of early identification of the need for support in learning should guarantee that no one is left behind.

Previous research has shown that Finnish comprehensive school students' academic performance is of top-quality in international comparisons (The Organisation for Economic Co-operation and Development [OECD], 2018; Mullis et al., 2017). However, they rate issues related to school satisfaction and well-being more negatively than in the OECD-countries, on average, and even in comparison with their Nordic counterparts Sweden and Denmark (Yoon & Järvinen, 2016). Already in primary school, Finnish children report a higher amount of perceived workload and less emotional and cognitive engagement than their international peers (Currie et al., 2012; Mullis et al., 2017). This is worth closer examination, since schooling amounts to far more than cognitive achievements and academic performance.

### **Procedure and Participants**

Children's self-reported answers were collected within the framework of a Finnish follow-up study titled Steps to the Healthy Development and Well-Being of Children (the STEPS Study; for more detail see Lagström et al., 2013). The survey was administered to all STEPS study children who were born in the year 2008 or 2009 and actively involved with the study at the data collection point ( $N = 1,163$ ). The online questionnaire was sent to the participating children via parental email. Parents were informed about the purpose of the study and provided with a standard set of instructions to administer the survey in a home setting. The children were asked to complete the instrument independently. Parents were allowed to assist them in case of need (e.g., to read the questions aloud). Feedback from parents indicated that the children completed the instrument diligently.

In total, 403 children completed an online questionnaire between December 2017 and January 2018 (34.8% response rate). Of these, 51% were girls and the mean age was 8.5 years ( $SD = 0.50$ ). The study participants were from a range of familial SES levels from 1 (highest) to 9 (lowest) based on an International Standard Classification of Occupations ISCO-08 (International Labour Organization, 2012). With a mean of 2.75 ( $SD = 1.55$ ) this is consistent with the targeted sub-study population, though slightly higher than the national average (Lagström et al., 2013).

## **Measures**

The questionnaire based on the International Survey of Children's Well-Being was applied (ISCWeB; for more detail see Rees & Main, 2015). The data for the analyses consisted of 16 statements about academic stress, academic buoyancy, social support, and emotional and cognitive engagement, which all measured the task-related elements of school work. The gender information was elicited from the children and coded 1 for females and 2 for males. Parents' occupational statuses were added to the present data from the STEPS registers. The SES of the family was coded based on the highest occupation held in the family.

### **The Independent Variables**

To evaluate children's perception of academic stress, the three-item HBSC academic stress subscale was applied (Kämpfi et al., 2012). It measures the task-related overload from schoolwork (e.g., "I have too much schoolwork"). To each item children rated themselves on a 1–5 scale (1 = strongly disagree, 5 = strongly agree). The higher scores indicate the higher academic stress.

### **The Mediator Variables**

The modified Academic Buoyancy Scale (ABS) from Martin and Marsh (2008a, 2008b) was utilized. Following the theoretical dimensions of the original scale, academic buoyancy scale for primary school children included four linguistically simplified items referring to one's ability to deal with setback ("I am not bothered by a poor number"), challenge ("I don't mind if I find schoolwork difficult"), stress (I don't worry too much about school stuff, e.g., "undone homework"), and pressure ("I don't mind if I have too

much schoolwork”) occurring in the ordinary course of school life. The constructed buoyancy items were tested on a focus group with primary school children. Instead of the original 7-point scale, the items were rated from 1 (strongly disagree) to 5 (strongly agree). The smaller amount of response categories have been proven to give better results among children of this age (Borgers et al., 2000). The higher the score of the children was, the more buoyant they were.

Social support was assessed via children’s perception of receiving support in the case of problems in school. The scale consisted of three items reflecting support from the teacher, from other children in the class, and from family members (Rees & Main, 2015). For each item (e.g., “In case of problems in school, my teacher helps me”), respondents rated themselves from 1 (strongly disagree) to 5 (strongly agree). The higher the score, the more support children perceived. The descriptive data, reliability coefficients, and factor loadings for the scales are presented in Table 1.

Table 1 Measure descriptive, reliability, and CFA statistics

Measure	items	M	SD	Skew	Kurtosis	$\alpha$	Factor loadings
Academic Stress	3	2.47	.93	.359	-.243	.70	0.53-0.75
Academic buoyancy	4	3.58	.83	-.322	-.180	.65	0.36-0.81
Social support	3	4.28	.68	-1.106	1.258	.56	0.55-0.60
Emotional engagement	3	4.04	.89	-.991	.699	.88	0.82-0.88
Cognitive engagement	3	4.42	.61	-1.012	.583	.73	0.62-0.77

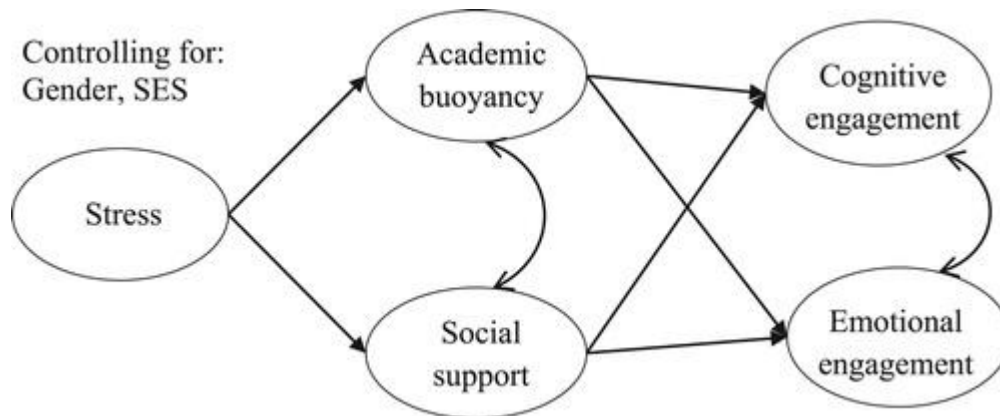
## **The Dependent Variables**

Two dependent scales, one measuring emotional and the other cognitive engagement, were adapted. Positive affect was the indicator of emotional engagement. This construct measured students' enjoyment and interest in school and school work with three items (e.g., "I like going to school") which were derived from the HBSC study (Kämpfi et al., 2012). Cognitive engagement was measured in terms of students' intrinsic motivation and commitment to school work (e.g., "I always try my best at school") by the three-item scale used in studies such as the International Study of City Youth (ISCY; for more details see Lamb et al., 2015). Responses for each engagement item were rated along the same 5-point scale as presented above. The higher scores indicated higher school engagement.

## **Statistical Analysis**

Initial analyses employed confirmatory factor analysis (CFA) using Mplus software, version 8.0 (Muthén & Muthén, 1998–2017) to evaluate whether children's responses conformed to hypothesized factors. A multiple group confirmatory factor analysis (MGCFA) was applied to test the measurement invariance across the gender. Measurement invariance was tested for three different levels. We first established the configural invariance model, then we compared the metric invariance and the scalar invariance models with the less restrictive model. The hypothesized model (Figure 1) was tested using structural equation modeling (SEM). Figure 1 illustrates the measurement model including hypothesized effects between study factors. The gender and parental SES were controlled as covariates. The parameters of the model were estimated using maximum likelihood estimation. To test whether indirect pathways from perceived stress had a significant impact on emotional and behavioral engagement, we conducted bootstrapping (bootstrap = 500) to assess the effects of mediators by constructing confidence intervals (CI) around the estimates (see Hayes, 2013).

Figure 1. Hypothesized model of interrelations between academic stress, academic buoyancy, social support, and emotional and cognitive engagement.



The fit of the model was evaluated by a Chi-square test statistic and fit indices including the Root Mean Square Error of Approximation (RMSEA), the Standardized Root Mean Square Residual (SRMR), the Tucker–Lewis Index (TLI), and the Comparative Fit Index (CFI). The following cutoff values were used as recommended by Hu and Bentler (1999): RMSEA and SRMR values below .08, and TLI and CFI values close to or over .95 indicate a well-fitting model. While the ratios of the Chi-square statistic and degrees of freedom were considered carefully, the statistical significance of the Chi-square value alone was not interpreted to indicate an ill-fit (Hu, & Bentler, 1999). A small amount of missing data (0.2–1.7% per items) was handled with the Expectation Maximization (EM) algorithm.

## Results

### Preliminary Descriptive and Psychometric Analyses

Descriptive statistics, multi-item factor reliabilities, and distributional properties for the factors are shown in Table 1. With regard to normality, the study variables univariate distributions were all within a reasonable range (skewness  $\pm 2$ , kurtosis  $\pm 7$ ; see Curran et al., 1996). The internal consistencies of the scales (Cronbach’s alpha) varied between  $.56 \leq \alpha \leq .88$ . Confirmatory factor analysis of the students’ responses to the 16 items of stress, buoyancy, social support, and engagement verified that the hypothesized factors were measured by discrete, single latent variables. The five factors were allowed to

inter-correlate, and the errors were expected to be uncorrelated. The standardized factor loadings ranged from .36 to .88 (). All items were statistically significant at the  $p < .001$  level. Despite the relatively low loadings of the two buoyancy items, they were included in the model as their coefficients were statistically significant and contributed independently to the fit of the measurement model. The five-factor measurement model fit the data well for males (CFI = .953, TLI = .940, RMSEA = .051, SRMR = 0.054) and females (CFI = .935, TLI = .916, RMSEA = .062, SRMR = 0.052). Also the conditions for the measurement invariance was met (see Appendix for the group invariance models). This implies that subjects with equivalent latent construct scores respond similarly to items across the gender. The latent correlations are provided in Table 2 to complement the estimated standardized factor loadings in Table 1. All correlations between the latent factors were statistically significant and in the expected directions. Stress was negatively correlated with all other variables. In contrast, academic buoyancy and social support were positively correlated with engagement factors.

Table 2 Latent correlations from the CFA

Measure	Academic stress	Academic buoyancy	Social support	Emotional engagement
Academic buoyancy	-.633			
Social support	-.585	.593		
Emotional engagement	-.693	.636	.728	
Cognitive engagement	-.563	.656	.737	.699

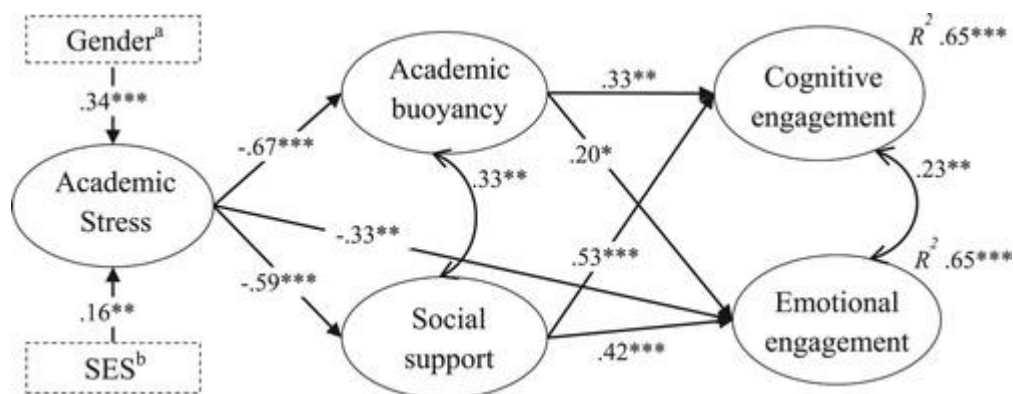
Note:  $p < .001$  for all presented correlations

### Structural Equation Modeling

Proceeding to SEM analyses, the hypothesized theoretical model depicted in Figure 1 alongside gender and SES as covariates was tested. The model represented a good fit to the data,  $\chi^2 = 253.58$  (116),  $p < .001$ , RMSEA = .056, CFI = .939, TLI = .920, SRMR = .044. Figure 2 shows the standardized beta coefficients for the depicted

associations. Only significant associations are presented. Except the effect between stress and cognitive engagement, all direct effects were significant. The variance in children’s cognitive ( $R^2 = .65$ ) and emotional engagement ( $R^2 = .65$ ) were significantly explained by the identified model. Children’s perception of academic stress significantly predicted academic buoyancy, social support, and emotional engagement. The higher the stress the lower the buoyancy, perceived social support, and emotional engagement. In contrast, the more buoyant children were, and the more social support they perceived, the more cognitively and emotionally engaged they were. With regard to covariates, boys and children with higher SES perceived more academic stress than girls or children with lower SES did. The covariates were not significantly associated with other study constructs.

Figure 2. Structural equation model of the relations between perceived stress, academic buoyancy, social support, and emotional and cognitive engagement (controlling for gender and SES). Standardized coefficients.



Notes: <sup>a</sup>Coded 1 = female, 2 = male; <sup>b</sup>Coded 1 (highest) to 9 (lowest); \*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$ .

Regarding the hypothesized mediation effects with bias-corrected confidence intervals, indirect effects were observed in the relationship between perceived stress and cognitive engagement mediated by both academic buoyancy and social support. The indirect paths and effects from stress to cognitive and emotional engagement are shown in Table 3. Another indirect effect was observed in the relationship between stress and emotional engagement, which was mediated by social support.

Table 3 Indirect paths and effects from stress to cognitive and emotional engagement (standardized coefficients)

	Effect	SE	<i>p</i>	CI
From stress to cognitive engagement:				
Total	-.563	.065	< .001	95% CI [-.42, -.23]
Total indirect	-.529	.114	< .001	95% CI [-.49, -.18]
Specific indirect				
cognitive engagement academic buoyancy stress	-.218	.085	= .010	95% CI [-.24, -.03]
cognitive engagement social support stress	-.311	.103	= .003	95% CI [-.32, -.08]
From stress to emotional engagement:				
Total	-.704	.061	< .001	95% CI [-.82, -.52]
Total indirect	-.371	.087	< .001	95% CI [-.55, -.20]
Specific indirect				
emotional engagement academic buoyancy stress	-.125	.065	= .053	95% CI [-.24, .02]
emotional engagement social support stress	-.245	.082	= .003	95% CI [-.42, -.11]

Notes: CI = confidence intervals: a percentile bootstrapping method for the specific mediation effects was used (sample size 500).

The effect of academic stress on cognitive engagement was fully mediated by academic buoyancy and social support. For the connection between stress and emotional engagement, social support acted as partial mediator given that the direct association between stress and emotional engagement was also significant (see Table 3).

## **Discussion**

The present study sought to identify the mechanisms of how academic buoyancy and social support influence the relationship between academic stress and school engagement. In doing so, we extended the knowledge of academic stressors among primary school students and showed that interrelations between student's stress appraisals, person-internal and person-external factors, and school engagement both exist, and that these are complex. The key findings of the study are discussed below.

### **Findings of Note**

Students, already at the beginning of their school career, perceive academic stress, which is negatively associated with school engagement. Students with higher levels of academic stress were more disengaged or disaffected in school, which is characterized by unwillingness to persevere with school tasks or to strive for the personal best and perceiving negative feelings about school. As hypothesized, children with a higher amount of stress showed lower levels of academic buoyancy and reported to perceive less social support than their unstressed counterparts. Further, academically buoyant and socially supported children showed more school engagement than less buoyant and less supported children. Our findings contribute to previous research proposing comparable associations among adolescents (Collie, Martin, et al., 2017; Martin, 2014; Raufelder et al., 2014).

In line with previous research, primary school boys and children from families with higher SES were more impacted by stress than girls and children from families with lower SES (Currie et al., 2012; Inchley et al., 2016). The result emphasized stress in children from families with higher SES to be in line with the latest research (Inchley et al., 2016) and the discussion about the features of contemporary knowledge society placing pressure on achievement and especially on middle-class families. This reflects the changes in the historical relationship between education and the middle classes (Ball, 2003). Middle-class families, in particular, are those who have benefited from the opportunities provided by meritocratic society, in which high emphasis is placed on degrees and competition (Bourdieu, 1986). However, in the new conditions of choice, competition and the inflation of educational degrees, middle-class families have to work

harder to maintain their advantages, which may be reflected in the pressure they put on their children's academic attainment (Ball, 2003).

Consistent with Miller et al.'s (2013) study on primary school students, however inconsistent with previous research on older students (e.g., Currie et al., 2012; Martin, 2014; Martin & Marsh, 2006; Wang & Eccles, 2012b), we found no gender differences or differences based on SES regarding other study constructs. With regard to other academic dimensions, the differences based on sociodemographic factors seem to arise only later, which speaks for a certain changeability in students' engagement and how they perceive support and buoyancy.

Aligning with prior work demonstrating the role of academic buoyancy as a mediator between anxiety and learning strategies (Collie, Ginns, et al., 2017) and anxiety and engagement outcomes (Martin & Marsh, 2006), we found buoyancy mediating the association between academic stress and cognitive engagement, and partially mediating the effect on emotional engagement. The effect of stress on cognitive engagement being fully mediated by academic buoyancy reveals the significance of being able to effectively cope with everyday academic adversities. Following the reasoning of Collie, Ginns, et al., (2017), we conclude that experiences of academic stress, when feeling able to handle them effectively, may have a beneficial impact on students' persistence on academic tasks. However, a non-significant mediation effect on emotional engagement indicated that being academically buoyant does not suffice alone to buffer the effects of stress on emotional engagement. Over and above mediation effects, stress negatively affected a student's enjoyment in school. This, however, does not diminish academic buoyancy's significance in relation to emotional engagement. Being academically buoyant predicted independently student's enjoyment in school, which further on, may contribute to students' well-being and academic achievement (Pietarinen et al., 2014; Wang et al., 2015). However, more research needs to be conducted to test the hypothesized relationships.

Another key finding of our study is the importance of social support in promoting academic buoyancy (cf. Martin, 2014), buffering stress (Torsheim et al., 2003) and further on, mediating the effect of stress on school engagement. As our results showed social support is important with regard to both cognitive and emotional engagement. As with by buoyancy, we assume that when children receive sufficient help from their

significant others, academic stress may advance a child's buoyancy and perseverance on academic tasks, which lead to lesser disengagement. Also the direct effects from social support to both engagement components highlight the importance of becoming help when facing difficulties in school (cf. Wang & Eccles, 2012b; Woolley & Bowen, 2007).

### **Implications for Practice**

Our results underline the need for an early intervention in the case of primary school-related stress. At worst, such stress diminishes children's engagement and may have long-lasting effects on their overall school adjustment and academic achievement (Fredricks et al., 2004). A decreased interest, enthusiasm, excitement, willingness, and preference for challenge, as embodiments of engagement (see Skinner & Pitzer, 2012), present warning signals for teachers and parents that may be tracked to student's academic work overload or task difficulty.

We emphasize that both academic buoyancy and social support are important when designing prevention initiatives aimed at helping children to handle academic stress. When buffered by an environment of supportive relationships, and with a strengthened sense of control over academic tasks, stress at some point can be harnessed to promote children's willingness to invest in learning and for their school enjoyment (Martin & Marsh, 2008a). Central to the notion of positive stress among primary school children is, however, the availability of a caring and responsive adult support in coping with the stressors.

Developing children's academic buoyancy from early on builds their strengths and emphasizes proactive rather than reactive responses to everyday challenges (Martin & Marsh, 2008a). Practices to develop buoyancy can be harnessed for all students (Martin, 2013) and as demonstrated by our study results, in connection with social support. While teaching awareness and encouragement to identify academic stress and abilities to cope with it on an individual level, the role of positive and supportive class climate should be fostered. Thus, integration of collaboration and social connection, together with mindful attention to academic challenges, may offer opportunities to reach and sustain a school culture of buoyancy. As found in a previous study on the school engagement of Finnish adolescents, the features of school culture, such as teachers'

positive attitudes towards students, treating them friendly and showing that they care about their well-being are significant factors connected to students' overall school engagement (Järvinen & Tikkanen, 2019). Thus, school culture where the emphasis is put not only on learning but the psychological and social development of children, can be argued as having a positive impact also on the development of children's academic buoyancy.

### **Limitations and Future Directions**

Some methodological limitations of the current study should be noted. First, the study is based on cross-sectional data, and does not allow conclusions about causality.

Alternative causal directions and relationships are possible. Indeed, it is likely that significant others also respond differently to children depending on their level of engagement, and depending on social support available, children perceive different levels of academic stress (e.g., Skinner & Pitzer, 2012). Future research may wish to utilize a prospective design to confirm the above findings longitudinally. Addressing the period from early childhood to adolescence would allow analyzing changes in relationships at different levels, as well as the influence of these changes on the maintenance of the studied academic processes. A longitudinal study design would also shed light into the observed gender shift in students' academic stress experiences, which, based on separate studies, seem to occur in the transition from the primary to secondary school (Inchley et al., 2016).

Second, the study relied on a relatively small and local sample of Finnish elementary children and overrepresented students with higher SES, so the research findings should be generalized with caution. To understand whether the revised academic constructs are valid and reliable measures for Finnish primary school students in general, more systematically collected and nationally representative samples are warranted. This limitation applies especially the constructed academic buoyancy and social support scales. The modest factor loadings of buoyancy construct's two items needs to be explored in greater depth in future research. However, academic buoyancy functioned as a meaningful outcome, predictor, and mediator factor in the structural equation model, which speaks for the concurrent validity of the scale (cf. Martin & Marsh, 2006, 2008a). The low alpha coefficient for social support may indicate, that children's perception of social support vary depending on the source of support. This calls for

further studies to analyze the importance of separate social partners in buffering students' academic stress, and in advancing their buoyancy and school engagement.

Third, the present data is based on self-report data only, which may represent a potential threat to validity and reliability. Future research should consider the reports from multiple informants (e.g., parents and teachers). We also address how all participants in the study were recruited via parents. Thus, beyond the measured demographics, the acquired sample may have differed in important and unmeasured ways from non-participants.

Finally, with regard to school, several aspects may give rise to stress in children. School is for children both a work environment and a social arena. The present study examined only children's stress appraisals related to demands and challenges at work. However, social relations within the school such as having friends as a social support or, in the other end, exposure to harassment or bullying, can be regarded as the greatest school stressor of all (e.g., Östberg et al., 2015). Thus, it would be worth studying different school stressors in combination and their possible accumulative effects on school outcomes.

## **Conclusion**

Despite its limitations, this study makes multiple contributions to our understanding of primary school children's perceptions of several academic phenomenon in the Finnish context. Findings from this study showed that there is merit in examining academic buoyancy already among the youngest. Together with support from significant others, being able to effectively navigate academic challenges was found important to maintain emotional and cognitive engagement with school. We find the results relevant to educational practitioners in schools when seeking to support students' well-being and provide a learning environment that supports every children's academic path. Investing in children's school enjoyment and motivation from early on is likely to pay off as students' experiences of success and emotional well-being, which may affect the motivational and educational climate of schools also more broadly (cf. Wang et al., 2015). This requires educational efforts (1) for the early identification of children perceiving stress to prevent prolongation of it and (2) to provide knowledge to teachers

about the associations and impact of academic buoyancy and social support both in buffering school-related stress and enhancing school enjoyment and motivation.

### **Disclosure Statement**

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

### **Additional information**

#### **Funding**

This work was supported by Academy of Finland [grant number 308306].

## References

- Appleton, J. J., Christenson, S. L., Kim, D., & Reschly, A. L. (2006). Measuring cognitive and psychological engagement: Validation of the student engagement instrument. *Journal of School Psychology, 44*(5), 427–445.
- Aspinwall, L. G., & Taylor, S. E. (1997). A stitch in time: Self-regulation and proactive coping. *Psychological Bulletin, 121*(3), 417–436.
- Ball, S. J. (2003). The risks of social reproduction: The middle class and education markets. *London Review of Education, 1*(3), 163–175.
- Behnsen, P., Buil, M., Koot, S., Huizink, A., & van Lier, P. (2018). Classroom social experiences in early elementary school relate to diurnal cortisol levels. *Psychoneuroendocrinology, 87*, 1–8.
- Borgers, N., de Leeuw, E., & Hox, J. (2000). Children as respondents in survey research: Cognitive development and response quality. *Bulletin of Sociological Methodology/Bulletin de Méthodologie Sociologique, 66*(1), 60–75.
- Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (Ed.), *Handbook of theory and research in the sociology of education* (pp. 241–258). Greenwood Press.
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310–357.
- Collie, R. J., Ginns, P., Martin, A. J., & Papworth, B. (2017). Academic buoyancy mediates academic anxiety's effects on learning strategies: An investigation of English- and Chinese-speaking Australian students. *Educational Psychology, 37*(8), 947–964.
- Collie, R. J., Martin, A. J., Bottrell, D., Armstrong, D., Ungar, M., & Liebenberg, L. (2017). Social support, academic adversity and academic buoyancy: A person-centred analysis and implications for academic outcomes. *Educational Psychology, 37*(5), 550–564.
- Collie, R. J., Martin, A. J., Malmberg, L.-E., Hall, J., & Ginns, P. (2015). Academic buoyancy, student's achievement, and the linking role of control: A cross-lagged

analysis of high school students. *British Journal of Educational Psychology*, 85, 113–130. <https://doi.org/10.1111/bjep.12066> doi: 10.1111/bjep.12066

Compas, B. E., Connor-Smith, J. K., Saltzman, H., Harding Thomsen, A., & Wadsworth, M. E. (2001). Coping with stress during childhood and adolescence: Problems, progress, and potential in theory and research. *Psychological Bulletin*, 127(1), 87–127.

Curran, P. J., West, S. G., & Finch, J. F. (1996). The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis. *Psychological Methods*, 1(1), 16–29.

Currie, C., Zanotti, C., Morgan, A., Currie, D., Looze, M. d., Roberts, C., Samdal, O., Smith, O. R. F., & Barnekow, V. (Eds.). (2012). *Social determinants of health and well-being among young people. Health behaviour in school-aged children (HBSC) study: International report from the 2009/2010 survey* (Health Policy for Children and Adolescents, No. 6). WHO Regional Office for Europe.

Datu, J. A. D., & Yuen, M. (2018). Predictors and consequences of academic buoyancy: A review of literature with implications for educational psychological research and practice. *Contemporary School Psychology*, 22(3), 207–212.

De Anda, D. D., Baroni, S., Boskin, L., Buchwald, L., Morgan, J., Ow, J., Gold, J. S., & Weiss, R. (2000). Stress, stressors and coping among high school students. *Children and Youth Services Review*, 22(6), 441–463.

Eccles, J. (1999). The development of children ages 6 to 14. *The Future of Children*, 9(2), 30–44.

Eccles, J. S. (2016). Engagement: Where to next? *Learning and Instruction*, 43, 71–75.

Fall, A. M., & Roberts, G. (2012). High school dropouts: Interactions between social context, self-perceptions, school engagement, and student dropout. *Journal of Adolescence*, 35(4), 787–798.

- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*(1), 59–109.
- Furrer, C., & Skinner, E. (2003). Sense of relatedness as a factor in children's academic engagement and performance. *Journal of Educational Psychology, 95*(1), 148–162.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford.
- Hirvonen, R., Yli-Kivistö, L., Putwain, D. W., Ahonen, T., & Kiuru, N. (2019). School-related stress among sixth-grade students – Associations with academic buoyancy and temperament. *Learning and Individual Differences, 70*, 100–108.
- Hjern, A., Alfvén, G., & Östberg, V. (2007). School stressors, psychological complaints and psychosomatic pain. *Acta Paediatrica, 97*(1), 112–117.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives, structural equation modeling. *A Multidisciplinary Journal, 6*, 1–55.
- Inchley, J., Currie, D., Young, T., Samdal, O., Torsheim, T., Augustson, L., Mathisen, F., Aleman-Diaz, A., Molcho, M., Weber, M., & Barnekow, V. (Eds.). (2016). *Growing up unequal: Gender and socioeconomic differences in young people's health and well-being. Health behaviour in school-aged children (HBSC) study: International report from the 2013/2014 survey* (Health Policy for Children and Adolescents, No. 7). WHO Regional Office for Europe.
- International Labour Organization. (2012). *International standard classification of occupations – ISCO-08. Vol. 1. Structure, group definitions and correspondence tables*.
- Järvinen, T., & Tikkanen, J. (2019). Student disengagement in comprehensive school in Turku, Southwest Finland. In J. Demanent & M. Van Houtte (Eds.), *Resisting education: A cross-national study on systems and school effects* (pp. 81–102). Springer.

Kaplan, D. S., Liu, R. X., & Kaplan, H. B. (2005). School related stress in early adolescence and academic performance three years later: The conditional influence of self expectations. *Social Psychology of Education*, 8(1), 3–17.

Karvonen, S., Vikat, A., & Rimpelä, M. (2005). The role of school context in the increase in young people's health complaints in Finland. *Journal of Adolescence*, 28(1), 1–16.

Kämppi, K., Välimaa, R., Ojala, K., Tynjälä, J., Haapasalo, I., Villberg, J., & Kannas, L. (2012). *Koulukokemusten kansainvälistä vertailua 2010 sekä muutokset Suomessa ja Pohjoismaissa 1994–2010 – WHO-koululaistutkimus* [International comparison of school experiences 2010 and changes in Finland and Nordic countries 1994–2010 – HBSC-study] (The Ministry of Education, Follow-up Reports No. 8). Research Centre for Health Promotion.

Ladd, G. W., & Dinella, L. M. (2009). Continuity and change in early school engagement: Predictive of children's achievement trajectories from first to eighth grade? *Journal of Educational Psychology*, 101(1), 190–206.

Lagström, H., Rautava, P., Kaljonen, A., Räihä, H., Pihlaja, P., Korpilahti, P., Peltola, V., Rautakoski, P., Österbacka, E., Simell, O., & Niemi, P. (2013). Cohort profile: Steps to the healthy development and well-being of children (the STEPS study). *International Journal of Epidemiology*, 42(5), 1273–1284.

Lamb, S., Jackson, J., & Rumberger, R. (2015). *ISCY technical paper: Measuring 21st century skills in ISCY*. Victoria University, Centre for International Research on Educational Systems. Retrieved from February 19, 2018, from

Lau, B. W. K. (2002). Does the stress in childhood and adolescence matter? A psychological perspective. *Journal of the Royal Society for the Promotion of Health*, 122(4), 238–244.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.

Li, Y. (2011). School engagement: What it is and why it is important for positive youth development. *Advances in Child Development and Behavior*, 41, 131–160.

- Li, Y., & Lerner, R. M. (2013). Interrelations of behavioral, emotional, and cognitive school engagement in high school students. *Journal of Youth and Adolescence*, 42(1), 20–32.
- Martin, A. J. (2008). Enhancing student motivation and engagement: The effects of a multidimensional intervention. *Contemporary Educational Psychology*, 33(2), 239–269.
- Martin, A. J. (2013). Academic buoyancy and academic resilience: Exploring ‘everyday’ and ‘classic’ resilience in the face of academic adversity. *School Psychology International*, 34(5), 488–500.
- Martin, A. J. (2014). Academic buoyancy and academic outcomes: Towards a further understanding of students with attention-deficit/hyperactivity disorder (ADHD), students without ADHD, and academic buoyancy itself. *British Journal of Educational Psychology*, 84(1), 86–107.
- Martin, A. J., Burns, E., & Collie, R. J. (2017). ADHD, personal and interpersonal agency, and achievement: Exploring links from a social cognitive theory perspective. *Contemporary Educational Psychology*, 50, 13–22.
- Martin, A. J., Colmar, S. H., Davey, L. A., & Marsh, H. W. (2010). Longitudinal modeling of academic buoyancy and motivation: Do the ‘5Cs’ hold up over time? *British Journal of Educational Psychology*, 80, 473–496.
- Martin, A. J., & Dowson, M. (2009). Interpersonal relationships, motivation, engagement, and achievement: Yields for theory, current issues, and educational practice. *Review of Educational Research*, 79(1), 327–365.
- Martin, A. J., Ginns, P., Brackett, M. A., Malmberg, L.-E., & Hall, J. (2013). Academic buoyancy and psychological risk: Exploring reciprocal relationships. *Learning and Individual Differences*, 27, 128–133.
- Martin, A. J., & Marsh, H. W. (2006). Academic resilience and its psychological and educational correlates: A construct validity approach. *Psychology in the Schools*, 43(3), 267–281.

Martin, A. J., & Marsh, H. W. (2008a). Academic buoyancy: Towards an understanding of students' everyday academic resilience. *Journal of School Psychology, 46*(1), 53–83.

Martin, A. J., & Marsh, H. W. (2008b). Workplace and academic buoyancy: Psychometric assessment and construct validity amongst school personnel and students. *Journal of Psychoeducational Assessment, 26*(2), 168–184.

Martin, A. J., & Marsh, H. W. (2009). Academic resilience and academic buoyancy: Multidimensional and hierarchical conceptual framing of causes, correlates, and cognate constructs. *Oxford Review of Education, 35*(3), 353–370.

Martin, A. J., Yu, K., Ginns, P., & Papworth, B. (2017). Young people's academic buoyancy and adaptability: A cross-cultural comparison of China with North America and the United Kingdom. *Educational Psychology, 37*(8), 930–946.

Masten, A. S., Cutuli, J. J., Herbers, J. E., & Reed, M.-G. J. (2009). Resilience in development. In S. J. Lopez & C. R. Snyder (Eds.), *The Oxford handbook of positive psychology* (2nd ed., pp. 117–131). Oxford University.

Miller, S., Connolly, P., & Maguire, L. K. (2013). Wellbeing, academic buoyancy and educational achievement in primary school students. *International Journal of Educational Research, 62*, 239–248.

Mullis, I. V. S., Martin, M. O., Foy, P., & Hooper, M. (2017). *PIRLS 2016. International results in reading*. International Association for the Evaluation of Educational Achievement, IEA: Boston College.

Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus user's guide* (8th ed.) Muthén & Muthén.

Organisation for Economic Co-operation and Development. (2018). *PISA 2015 results in focus*.

Östberg, V., Almquist, Y. B., Folkesson, L., Brolin Låftman, S., Modin, B., & Lindfors, P. (2015). The complexity of stress in mid-adolescent girls and boys. Findings from the multiple methods school stress and support study. *Child Indicators Research, 8*(2), 403–423.

Pietarinen, J., Soini, T., & Pyhältö, K. (2014). Students' emotional and cognitive engagement as the determinants of well-being and achievement in school. *International Journal of Educational Research*, *67*, 40–51.

Putwain, D. W., Connors, L., Symes, W., & Douglas-Osborn, E. (2012). Is academic buoyancy anything more than adaptive coping? *Anxiety, Stress, & Coping*, *25*(3), 349–358.

Raufelder, D., Kittler, F., Braun, S. R., Lätsch, A., Wilkinson, R. P., & Hoferichter, F. (2014). The interplay of perceived stress, self-determination and school engagement in adolescence. *School Psychology International*, *35*(4), 405–420.

Rees, G., & Main, G. (2015). *Children's views on their lives and well-being in 15 countries: An initial report on the Children's Worlds Survey, 2013–14*. Retrieved June 15, 2018, from <http://www.isciweb.org/>

Salmela-Aro, K., & Upadyaya, K. (2014). School burnout and engagement in the context of demands-resources model. *British Journal of Educational Psychology*, *84*, 137–151.

Schneider, W., & Pressley, M. (1997). *Memory development between two and twenty*. Lawrence Erlbaum.

Skinner, E. A., Furrer, C., Marchand, G., & Kindermann, T. (2008). Engagement and disaffection in the classroom: Part of a larger motivational dynamic? *Journal of Educational Psychology*, *100*(4), 765–781.

Skinner, E. A., & Pitzer, J. R. (2012). Developmental dynamics of student engagement, coping, and everyday resilience. In S. Christenson, A. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 21–44). Springer.

Sotardi, V. A. (2016). Understanding student stress and coping in primary school: A mixed-method, longitudinal study. *Psychology in the Schools*, *53*(7), 705–721.

Torsheim, T., Aaroe, L. E., & Wold, B. (2003). School-related stress, social support, and distress: Prospective analysis of reciprocal and multilevel relationships. *Scandinavian Journal of Psychology*, *44*(2), 153–159.

Wang, M.-T., Chow, A., Hofkens, T., & Salmela-Aro, K. (2015). The trajectories of student emotional engagement and school burnout with academic and psychological development: Findings from Finnish adolescents. *Learning and Instruction, 36*, 57–65.

Wang, M.-T., & Eccles, J. (2012a). Adolescent behavioral, emotional and cognitive engagement trajectories in school and their differential relations to educational success. *Journal of Research on Adolescence, 22*(1), 31–39.

Wang, M.-T., & Eccles, J. S. (2012b). Social support matters: Longitudinal effects of social support on three dimensions of school engagement from middle to high school. *Child Development, 83*(3), 877–895.

Wentzel, K. R. (1998). Social relationships and motivation in middle school: The role of parents, teachers and peers. *Journal of Educational Psychology, 90*(2), 202–209.

Woolley, M. E., & Bowen, G. L. (2007). In the context of risk: Supportive adults and the school engagement of middle school students. *Family Relations, 56*(1), 92–104.

Woolley, M. E., & Grogan-Kaylor, A. (2006). Protective family factors in the context of neighborhood: Promoting positive school outcomes. *Family Relations, 55*(1), 93–104.

Yoon, J., & Järvinen, T. (2016). Are model PISA pupils happy at school? Quality of school life of adolescents in Finland and Korea. *Comparative Education, 52*(4), 427–448.

You, S., & Sharkey, J. (2009). Testing a developmental-ecological model of student engagement: A multilevel latent growth curve analysis. *Educational Psychology, 29*(6), 659–684.

## Appendix

### Goodness-of-fit indices for group invariance models of the measurement instrument

Model <sup>a</sup>	$\chi^2$	df	<i>p</i>	RMSE				$\Delta \chi^2$	$\Delta$ df	<i>p</i>
				A	CFI	TLI	SRMR			
Single group solutions										
Female	165.78	93	<.001	.062	.935	.916	.052	-	-	-
Male	140.30	93	=.001	.051	.953	.940	.054	-	-	-
Measurement invariance										
M1	306.08	186	<.001	.057	.944	.927	.053	-	-	-
M2	323.09	197	<.001	.057	.941	.928	.066	17.01	11	.108
M3	367.75	214	<.001	.060	.928	.919	.093	44.66	17	.998

Note: Female (N = 203), Male (N = 197); Following residual error was allowed to correlate: eeng1 with eeng3 (.53); <sup>a</sup> Models: M1, configural invariance (equal form); M2, metric invariance (factor loading constrained to be equal across groups); M3, scalar invariance (factor loadings and item intercept constrained to be equal across groups)