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2024

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Lakkavaara, A, Upadyaya, K, Tang, X & Salmela-Aro, K 2024, 'The role of stress mindset and academic buoyancy in school burnout in middle adolescence', *European Journal of Developmental Psychology*. <https://doi.org/10.1080/17405629.2024.2382398>

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To cite this article: Anne Lakkavaara, Katja Upadyaya, Xin Tang & Katariina Salmela-Aro (2024) The role of stress mindset and academic buoyancy in school burnout in middle adolescence, *European Journal of Developmental Psychology*, 21:6, 847-864, DOI: [10.1080/17405629.2024.2382398](https://doi.org/10.1080/17405629.2024.2382398)

To link to this article: <https://doi.org/10.1080/17405629.2024.2382398>



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Published online: 30 Jul 2024.



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RESEARCH ARTICLE



The role of stress mindset and academic buoyancy in school burnout in middle adolescence

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ABSTRACT

School burnout, defined as prolonged feelings of exhaustion, cynical attitude and inadequacy feelings towards schoolwork, can lead to mental problems during adolescence. To find effective ways to prevent burnout, this study examined the synergistic role of two positive personal resources, a stress-is-enhancing mindset and academic buoyancy in relation to school burnout dimensions. The participants were 932 Finnish middle-school 9th-grade (age = 14–15) students. The results of SEM revealed that academic buoyancy and stress-is-enhancing mindset were jointly negatively related to one dimension of school burnout, cynicism. However, the stress-is-enhancing mindset had an indirect effect on all dimensions (exhaustion, inadequacy and cynicism) via academic buoyancy. The findings highlight their joint effect and especially the role of academic buoyancy in relation to school burnout. The implications of the results to burnout prevention and stress theories are discussed.

ARTICLE HISTORY Received 15 November 2023; Accepted 11 July 2024

KEYWORDS School burnout; academic buoyancy; stress mindset; adolescence

Introduction

School burnout is defined as a response to constant school burden and consists of three dimensions; exhaustion caused by school demands, a cynical and detached attitude towards school, and feelings of inadequacy as a student (Salmela-Aro, Kiuru, et al., 2009). School burnout predicts negative outcomes such as mental health problems (Salmela-Aro, Savolainen, et al., 2009; Tang et al., 2021) and diminished academic performance (Madigan & Curran, 2021). For this reason, it is important to

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find effective ways to prevent school burnout and hinder these negative consequences.

The development of school burnout can be explained similarly to the development of job burnout. The original job demands-resources model (Demerouti et al., 2001) explains that burnout may develop by two different pathways: excessive demands may lead to exhaustion and the lack of job resources to disengagement. Later, the role of personal resources is added to the model (Xanthopoulou et al., 2007), and this model is also applied to school and university settings (Lesener et al., 2020; Salmela-Aro & Upadyaya, 2014). The demands-resources model in school settings (Salmela-Aro & Upadyaya, 2014; Salmela-Aro et al., 2022) describes how the high schoolwork demands and the lack of personal and study resources may lead to a negative path to school burnout. In the level of stress reaction, this same interplay between demands and resources is also present in the transactional theory of stress, which sees stress as arising when situational demands exceed the person's ability to cope (Lazarus & Folkman, 1984). Thus, in general, we may assume that the origin of school burnout lies in the discrepancy between demands and resources. On a detailed level, it is dependent on the core processes of how the school stress is viewed and managed and also in this process the role of resources is important.

Previous literature shows that different personal resources are related to lower levels of school burnout, but the evidence is still limited. Traits such as grit and optimism (Tang et al., 2021; Teuber et al., 2021), or emotion-related resources such as trait emotional intelligence (Romano et al., 2020), are relevant personal resources related to diminished school burnout. Also, positive self-beliefs, such as self-efficacy (Teuber et al., 2021), have been associated with lower levels of school burnout. In this study, we examine how two proximal and closely stress-related personal resources, stress mindset, the appraisal of the beneficial nature of stress (Crum et al., 2013); and academic buoyancy, the ability to handle everyday stress at school (Martin & Marsh, 2008), are separately and jointly related to school burnout in the face of normative 'everyday' school demands. With this objective, we aim to advance the field of burnout research by examining the role of personal resources in the school context to evaluate their usefulness as targets of preventive interventions.

Stress mindset

In general, stress is viewed as a negative feature and the aim of stress management interventions in school is stress reduction (van Loon et al., 2020). Yet lately, the focus in stress studies has shifted to examine also the beneficial consequences and the utility of stress in goal achievement (Crum et al., 2013, 2020). These novel studies emphasize that stress and its physiological effects can improve and boost performance, learning and growth. The original stress mindset theory (Crum et al., 2013) postulates that a person's evaluation of stress defines what kind of responses they have in stressful situations. Stress-is-debilitating mindset, the most common belief, means that stress itself is negative and the general response is to avoid it. Stress-is-enhancing mindset in turn means that stress can be also beneficial, which can promote to engage in actions to deal with the stressor without avoiding it.

Several studies have empirically supported these stress mindset views. For instance, the stress-is-enhancing mindset has been shown to relate to better self-reported health, less symptoms of depression and anxiety, and beneficial physiological responses to stress (Crum et al., 2013, 2017; Huebschmann & Sheets, 2020; Jenkins et al., 2021). In the literature regarding adolescents, the study by Park et al. (2018) revealed that a stress-is-enhancing mindset was related to less stress among adolescents when facing adversities during the school year. Jiang et al. (2019) also found that the beneficial stress mindset was related to fewer depressive symptoms during higher-level stressful life events among immigrant adolescents. Thus, thinking about the positive outcomes of stress seems to have beneficial physiological, psychological and behavioural outcomes.

In school settings, stress mindset is examined in relation to well-being and the experiences of stress. For example, a beneficial stress mindset has been related to better psychological well-being via coping (Caleon et al., 2023; Keech et al., 2018). During stressful periods of schooling, a stress mindset is associated with lower symptoms of depression (Huebschmann & Sheets, 2020; Wang et al., 2022) and lower anxiety and stress symptoms (Wang et al., 2022). So far very little attention has been paid to the role of the stress mindset in school burnout. The results of two recent studies have shown that stress-is-debilitating mindset is related to higher levels of personal and school-related burnout (Klussman et al., 2020, 2021). However, these studies

only focused on a negative, stress-is-debilitating mindset; the role of a positive, stress-is-enhancing mindset in school burnout remains unexplored.

Academic buoyancy

Academic buoyancy has been defined as 'students' ability to successfully deal with the academic setbacks and challenges that are typical of the ordinary course of school life' (Martin & Marsh, 2008, p. 53). In other words, academic buoyancy is the ability to 'bounce back' from normative feelings of stress, that every student encounters. It is described as an ongoing proactive frontline response to challenges and viewed as a different construct than academic resilience, which elicits only when necessary (Martin & Marsh, 2009). As an ongoing activity, it is also separated from active coping (Putwain et al., 2012). We propose that academic buoyancy reflects a domain-general appraisal of own capacity to handle stress, which is the antecedent of coping. This conceptualization is also presented in the study of Hirvonen et al. (2019, p. 101), where they define academic buoyancy as 'students' beliefs that they can respond adaptively to the everyday pressure, challenges and setbacks they face in school'.

Several studies have revealed an association between academic buoyancy and beneficial psychological outcomes (see Datu & Yuen, 2018 for review). Academic buoyancy is negatively related to adverse outcomes such as anxiety, uncertain control and failure avoidance (Martin, 2013), and school-related stress (Hirvonen et al., 2019). It is also related to positive outcomes such as the enjoyment of school, class participation and general self-esteem (Martin & Marsh, 2006). Two recent studies have reported that academic buoyancy is negatively related to burnout (Salmela-Aro & Upadyaya, 2020; Vinter, 2021), and thus we regard it as an effective personal resource factor in school burnout.

Joint effect of stress mindset and academic buoyancy

In this study, we chose stress mindset and academic buoyancy as target personal resources to study for several reasons. First, to our knowledge, although these concepts are studied in relation to school burnout as previously mentioned, their joint effect is empirically and theoretically unknown. Second, a stress mindset is assumed to be unrelated to the amount of stress experienced (Crum et al., 2013). Also, academic

buoyancy is refined rather proactive than reactive response to academic adversity (Martin & Marsh, 2009), so they both are defined as resources that are independent of the amount of stress itself. Third, prior studies propose that they both are related, yet distinct constructs from coping (Caleon et al., 2023; Crum et al., 2013; Putwain et al., 2012). In sum, we expect that these personal resources share similar features and therefore could be also theoretically intertwined.

The theory of job demands-resources defines personal resources as beliefs that people hold reflecting the control over their environment and they therefore buffer the negative impact of demands (Bakker & Demerouti, 2017). Beliefs are also presented as factors that affect the appraisals, the key determinants in the stress process according to the transactional theory of stress and coping (Lazarus & Folkman, 1984). According to this theory, stress arousal is determined by two separate appraisals. The first is primary appraisal, which means the evaluation of the stressor. We propose that a stress mindset reflects a general level of stress belief, which is separate but related to this primary appraisal. The second form of appraisal is secondary appraisal, defined as 'evaluation of coping options, is not actually coping but is most often the cognitive underpinning for coping' (Lazarus, 1999, p. 76). We propose that academic buoyancy reflects a general form of secondary appraisal. So as in the transactional theory, the appraisals are related (Lazarus & Folkman, 1984), we also assume that stress mindset and academic buoyancy are intertwined and together buffer the negative impact of normative school stress and are related to lower levels of school burnout.

Current study

Our study intended to answer the following questions:

- (1) How stress-is-enhancing mindset and academic buoyancy are separately related to school burnout dimensions?
- (2) What kind of synergistic effect is between a stress-is-enhancing mindset and academic buoyancy in relation to school burnout dimensions?

As an answer to the first question, we expected that both stress-is-enhancing mindset and academic buoyancy are negatively related to school burnout. Regarding our second research question, we expected

that stress mindset and academic buoyancy would be jointly related in school burnout dimensions and this effect would be moderate or mediate. In the previous literature, there is evidence that a stress mindset serves as a moderator in predicting well-being (Jenkins et al., 2021; Jiang et al., 2019; Park et al., 2018). In addition, Keech et al. (2018) found that a stress mindset had an indirect effect on well-being via proactive coping behaviour and perceived somatic symptoms. Wang et al. (2022) showed that a stress-is-enhancing mindset had a positive effect on well-being and exam performance via challenge appraisals about exam stress. Since there is some evidence of the mediating role of academic buoyancy, it is also possible that academic buoyancy would mediate the effect of stress mindset on school burnout dimensions.

Methods

Participants and procedure

The data in this study consisted cross-sectional sample of a total of 1013 9th-grade students (51.9% female, 43.2% male, 4.8% other, aged 14–15) who took part in the third data collection of a longitudinal study. The data were collected from a total of 30 different schools, which cover approximately 65% of schools in Helsinki. The data collection was conducted in socio-economically different areas to ensure that the sample is as representative as possible. There were over 3200 students in these schools, and the target sample size was approximately 1200 students. Yet due to missing consents or non-usable answers of some participants, the total sample consisted of 1013 participants. Since there were participants who had missing data in all used items, the final sample was 932 participants. The participants answered to an online questionnaire concerning their experiences of school burnout, stress mindset, and academic buoyancy among various other study and background variables. Of all the participants, 77 (7.5%) had missing values in all examined variables, and after removing 4 outliers, a total of 932 participants were included in the analysis.

The data were collected in school during school lessons, and it took approximately 45 minutes to complete. The active consent was acquired from parents and the students gave their consent at the beginning of the questionnaire. The study protocol of the longitudinal study for 4 years was pre-examined and approved by the university's ethical board and the school division of the city.

Measures

School burnout was assessed using the original School Burnout Inventory, which consists of nine items divided into three subscales reflecting the components of school burnout (Salmela-Aro, Kiuru, et al., 2009). The subscales were (1) exhaustion at school (e.g., 'I feel overwhelmed by my schoolwork'), (2) cynicism towards the meaning of school (e.g., 'I feel lack of motivation in my schoolwork and often think of giving up'), and (3) sense of inadequacy at school (e.g., 'I often have feelings of inadequacy in my schoolwork'). All the questions were rated on a 6-point Likert scale (1 = strongly disagree; 6 = strongly agree). Cronbach's α was .84 for exhaustion, .86 for cynicism and .72 for inadequacy scale.

Stress mindset was measured using a shortened version of the stress mindset measure (Crum et al., 2013). Two questions measured the stress-is-enhancing mindset and opinions on the positive features of stress ('Stress increases the energy level' and 'Stress improves learning'). All the questions were rated on a 7-point scale (1 = strongly disagree; 7 = strongly agree). Cronbach's α for the reliability of the scale was .85.

Academic buoyancy was measured using the Academic Buoyancy Scale (Martin & Marsh, 2008). Three questions measured the students' opinions on handling everyday setbacks and adversities at school (e.g., 'I don't let study stress get on top of me' or 'I'm good at dealing with schoolwork pressures'). Each question was rated on a 7-point scale (1 = strongly disagree; 7 = strongly agree). Cronbach's α reliability of the scale was .90.

Analytic strategy

The means, standard deviations and distributional properties of the used scales were first calculated from observed variables using SPSS version 29. Pearson correlations were used to calculate first-order correlations between observed scales of stress mindset, academic buoyancy and school burnout dimensions. The confirmatory factor analysis (CFA) and structural equation modelling were performed with statistical software MPLUS version 8.8 (Muthén & Muthén, 1998–2017). The measurement model was evaluated before conducting structural models (Figure 1). Since there was a notable amount (5%) of participants that reported their as 'other', gender was not added as a covariate to avoid the reduction of sample size.

The joint effect of stress mindset and academic buoyancy on the school burnout dimension was examined in two parts. In the first part, the main

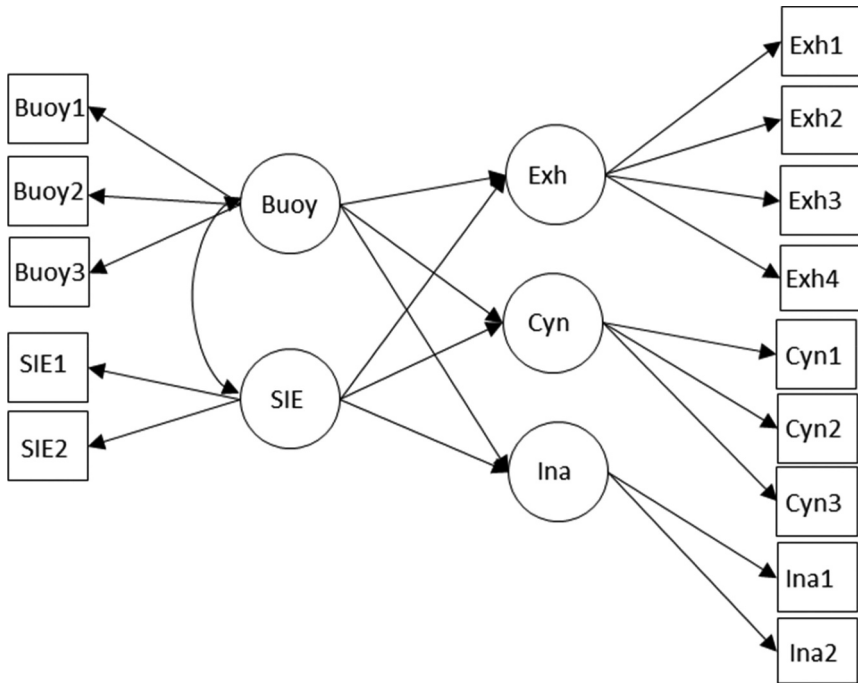


Figure 1. Measurement model and structural model for Model 1. Buoy = Academic buoyancy, SIE = Stress-is-enhancing mindset, Exh = Exhaustion, Cyn = Cynicism, Ina = Inadequacy.

effects and interaction effects of stress-is-enhancing and academic buoyancy against three school burnout dimensions were analysed with separate two models (Model 1 and 2). In Model 1, stress-is-enhancing and academic buoyancy predicted school burnout dimensions. In Model 2, the interaction between stress-is-enhancing and academic buoyancy was added as a third predictor to the model to evaluate the moderative role of stress mindset. In the second part, the full latent mediation modelling with 10,000 bootstrapped samples was conducted to test the indirect effects between stress mindset and school burnout dimensions via academic buoyancy (Model 3).

Results

Descriptives and bivariate relations

The correlations and descriptives of observed scales are presented in Table 1 and revealed that both stress-is-enhancing mindset and

Table 1. Descriptives and first-order bivariate correlations between scales.

	SIE	Academic Buoyancy	Exhaustion	Cynicism	Inadequacy
SIE	–				
Academic Buoyancy	.37***	–			
Exhaustion	–.22***	–.59***	–		
Cynicism	–.21***	–.40***	.61***	–	
Inadequacy	–.22***	–.50***	.70***	.73***	–
M	2.66	4.06	3.26	2.82	3.15
SD	1.56	1.66	1.32	1.44	1.46
Range	1–7	1–7	1–6	1–6	1–6

****p* < .001. SIE = stress-is-enhancing mindset.

academic buoyancy were negatively related to all burnout dimensions. The results also revealed that stress-is-enhancing mindset and academic buoyancy were positively related. The measurement model for all used scales provided a good fit $\chi^2(67) = 255.48$, *p* < .00, CFI = .97, TLI = .96, RMSEA = 0.032. The factor loadings ranged from .72 to .97. For the measurement model, we used the MLR estimator, maximum-likelihood parameter estimates with standard errors and a chi-square test statistic that is robust to non-normality and non-independence.

Direct and interaction effects against school burnout

The results of the first part of SEM models (Model 1 and Model 2) are presented in Table 2. The fit of the Model 1 was good ($\chi^2(67) = 255.48$, *p* < .00, CFI = .97, TLI = 0.96, RMSEA = 0.032), and the results showed that when measured jointly the effect of academic buoyancy was negatively related for all subscales, but the effect of stress-is-enhancing was negative only on cynicism. Respectively, the results of Model 2 showed that there was no interaction effect between stress-is-enhancing mindset and academic buoyancy against school burnout.

Table 2. Standardized results for Model 1 and Model 2, *n* = 932.

	Exhaustion		Cynicism		Inadequacy	
	M1	M2	M1	M2	M1	M2
Academic Buoyancy	–.68***	–.68***	–.43***	–.43***	–.61***	–.60***
SIE	.01	.01	–.08*	–.10*	–.02	.03
Academic BuoyancyXSIE		.01		.03		.03

****p* < .001, **p* < .05, SIE = Stress-is-enhancing mindset, M1 = Model 1, M2 = Model 2.

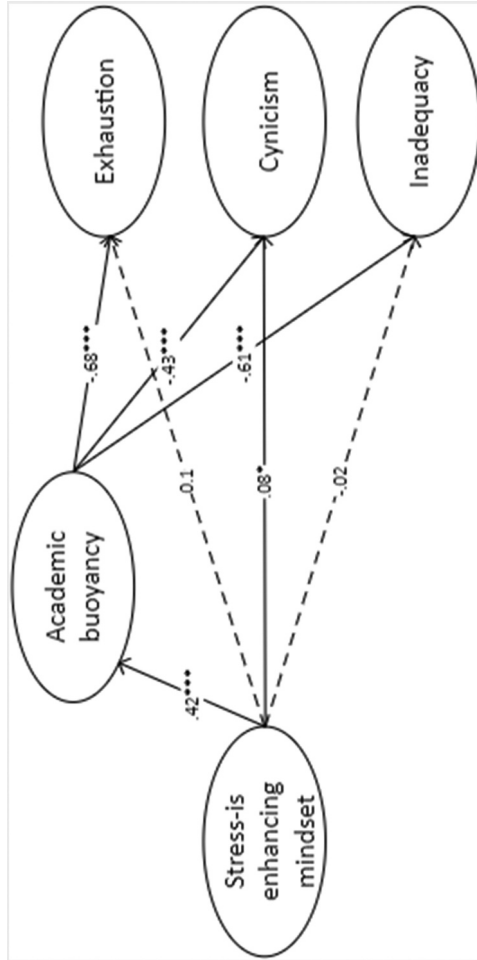


Figure 2. Model 3: effect of stress-is-enhancing mindset and academic buoyancy on school burnout dimensions. *** $p < .001$, ** $p < .01$, * $p < .05$. Parameters are standardized.

Table 3. Standardized indirect effects of stress-is-enhancing mindset (SIE) on school burnout via academic buoyancy.

Indirect effect	Estimate	<i>p</i>	95% CI [LB, UB]
SIE → Academic buoyancy → Exhaustion	-.29	<.001	[-.34, -.23]
SIE → Academic buoyancy → Cynicism	-.18	<.001	[-.23, -.14]
SIE → Academic buoyancy → Inadequacy	-.26	<.001	[-.32, -.20]

CI = confidence interval. LB = 95% CI lower bound. UB = 95% CI upper bound.

The indirect effects

The results of the mediation model (Model 3) are presented in [Figure 2](#) and [Table 3](#). The model fit was good ($\chi^2(67) = 311.19$, $p < .00$, CFI = .97, TLI = .96, RMSEA = .032). The results revealed that stress mindset had an indirect negative effect on all school burnout dimensions: exhaustion, cynicism and inadequacy via academic buoyancy.

Discussion

This study examined how stress-is-enhancing mindset and academic buoyancy were separately and jointly related to school burnout and the results supported both hypotheses. Separately, both stress-is-enhancing mindset and academic buoyancy were negatively related to all school burnout dimensions. For joint relation, we tested both direct, moderative and indirect effects, and our results confirmed, that stress-is-enhancing mindset and academic buoyancy were both related to cynicism. We also found that there was an indirect effect of stress mindset via academic buoyancy on all school burnout dimensions.

These results are consistent with prior findings regarding the beneficial psychological outcomes of the stress-is-enhancing mindset (Crum et al., 2013, 2017; Huebschmann & Sheets, 2020; Jenkins et al., 2021) and advances the field for two reasons. First, prior studies of stress mindset have mainly focused on stress or non-academic well-being outcomes, such as depression or life satisfaction (Huebschmann & Sheets, 2020; Jiang et al., 2019; Park et al., 2018; Wang et al., 2022). Second, prior studies of the connections between stress mindset and school burnout have focused on examining the stress-is-debilitating mindset (Klussman et al., 2020, 2021) rather than the stress-is-enhancing mindset. To conclude, our results confirm that the stress-is-enhancing mindset, indirectly via academic buoyancy, can be viewed as a protective factor against prolonged stress and school burnout, not only against stress or lack of well-being. This result supports the findings of a recent study which found that

a stress-is-enhancing mindset was related rather challenge than threat appraisals towards school exams (Wang et al., 2022). Thus, it is possible that students with a stress-is-enhancing mindset typically enjoy challenges at school and therefore are more academically buoyant and do not get overwhelmed by schoolwork so easily.

This study also supports the findings that academic buoyancy is related to well-being and lower levels of school burnout (Salmela-Aro & Upadaya, 2020; Vinter, 2021). These findings imply that the ability to 'bounce back' from everyday stress and minor setbacks may prevent the negative snowball effect of cumulative stress, which prevents the prolonged stress reaction of school burnout. In other words, daily recovery from stress is an important factor that protects against school burnout in middle adolescence. This assumption is supported by prior findings that academic buoyancy is related to lower levels of school-related stress and can serve as a buffer against the negative effects of stress (Hirvonen et al., 2019).

Our study did not support the previous findings that stress mindset has a moderating role in relations between well-being factors (Jenkins et al., 2021; Jiang et al., 2019; Park et al., 2018). Instead of having a buffering role, stress mindset had an effect against school burnout indirectly via academic buoyancy. This result emphasizes that academic buoyancy has a key role in relation to school burnout. This means that a stress mindset alone may not be a sufficient personal resource against school burnout, and the presence of academic buoyancy is important. This knowledge is important regarding practical implications, as interventions for school burnout prevention. Since the effect of a stress mindset is indirect via academic buoyancy, it could be more beneficial to support also directly academic buoyancy instead of solely focusing on supporting a stress-is-enhancing mindset. However, even though this study provides some evidence of the mediating role of academic buoyancy, further longitudinal studies are needed to draw conclusions about causal relations.

Theoretically, our results are in line with demand-resources theory which suggests that personal resources, as beliefs of reflecting the control over the environment are buffers against demands (Bakker & Demerouti, 2017). Along with this definition, we may argue that both stress-is-enhancing mindset and academic buoyancy are personal resources that support the control feelings in relation to school and thus buffer the negative effect of school demands. When students feel that stress can also have beneficial effects and are confident regarding

their ability to handle demands, they may resume better the feelings of control and are not that affected by the hectic exam periods or overlapping deadlines. In sum, the results advance the field of burnout studies by providing empirical support to the models that apply the demands-resources model from the occupation context to the school context (Lesener et al., 2020; Salmela-Aro & Upadyaya, 2014; Salmela-Aro et al., 2022).

These results also give support to the key assumptions of the transactional theory of stress, which emphasizes the role of the joint effect of primary and secondary appraisals in the stress process (Lazarus & Folkman, 1984). Our study implies that appraising stress as generally beneficial (primary appraisal component) has a role in school burnout when a student believes his/her ability to cope with everyday stress (secondary appraisal component). Based on our results, it is possible that both stress-is-enhancing mindset and academic buoyancy affect how school demands are perceived. They may contribute that school demands are not seen as stressful or alter what kind of coping is necessary. Yet to empirically verify these assumptions, more studies are needed, where the demands and coping is included.

Implications

According to this study, the beliefs about stress are important, as some stress is an inevitable part of schooling. There is promising evidence that short interventions that target supporting stress reappraisals or mindsets support adolescent well-being and performance. Teaching students the functional benefits of stress before tests was related to better test performance and more beneficial physiological and affective stress responses (Jamieson et al., 2022). The results of this study support the findings that synergistic mindset interventions may have promising effects on adolescent stress (Yeager et al., 2022). Evidence also shows that academic buoyancy can be supported by short web-based interventions that focus on supporting acceptance and commitment skills (Puolakanaho et al., 2019).

In conclusion, these promising results of our study offer new knowledge on school burnout prevention by suggesting that stress mindset interventions regarding school burnout prevention should include elements supporting academic buoyancy. For example, supporting day-to-day resilience through practical behavioural changes could, in the light of this study, be effective to prevent school burnout in middle adolescence.

Limitations

This study had several limitations. First and most importantly, it was based on cross-sectional data, which limit the interpretation of the results and prohibit drawing conclusions regarding the causal relation between variables. Second, this study was based solely on self-reports. Further studies are needed that use longitudinal study designs and different research methodologies, such as the experience sampling method or physiological measures to examine stress-related factors. Third, our study focused solely on the resources, and it is possible that several demands, such as school-related workload in the form of assignments, tests and exams, may affect students' experiences of burnout and interact with stress mindset and buoyancy.

Conclusion

This study proposes that general positive beliefs about the nature of stress (stress-is-enhancing mindset) and the ability to handle everyday stress (academic buoyancy) are meaningful personal resources against school burnout. This finding gives important support to models that apply the demands-resources theory (Bakker & Demerouti, 2017) in the school context (Lesener et al., 2020; Salmela-Aro et al., 2022). Since the effect of a stress-is-enhancing mindset on school burnout is indirect via academic buoyancy, the role of academic buoyancy is central. In conclusion, our study supports the importance of academic buoyancy in relation to school burnout and recommends that possible interventions for school burnout do not solely concentrate on supporting stress-enhancing without enhancing academic buoyancy. In the future, more studies are needed to examine possible gender differences, different profiles and development to further understand the impact of these personal resources on academic well-being.

Disclosure statement

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

Funding

This study was supported by the Academy of Finland to Katariina Salmela-Aro [308351, 336138, 345264, 345117, 358945]. Anne Lakkavaara was funded by a grant [200185] from the Jenny and Antti Wihuri Foundation.

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Data availability statement

The codes for the used analysis, data and materials are available upon request by contacting the corresponding author.

Author contributions

Anne Lakkavaara, Xin Tang and Katariina Salmela-Aro contributed to the study conception and design. Anne Lakkavaara wrote the manuscript and conducted the data analysis with Katja Upadyaya. All authors commented on multiple drafts, contributed substantially to the article and approved the submitted version.

Ethical declarations

The study protocol was pre-examined and approved by the University of Helsinki Ethical Review Board in the Humanities and Social and Behavioural Sciences [20/2018].

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