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Students' self-efficacy in self-regulation together with behavioural and emotional strengths: investigating their self-perceptions

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ABSTRACT

Students' self-perceptions are a foundation for educational and psychosocial development. In order to investigate self-perceptions, we need to recognise the preconceptions (e.g. doubts and confidence) students hold about themselves. In this study, we examined 10–16-year-old students' (N=599) self-perceptions from the viewpoints of the sources of self-efficacy in self-regulation and behavioural and emotional strengths. Specifically, we used descriptive analyses to examine whether students' ages or received pedagogical support played a role in how they perceived themselves, and whether these viewpoints are related to each other. Our results indicate that, in general, primary school students perceived their sources of self-efficacy in self-regulation and strengths more positively than did lower secondary school students. However, the experience of stress and anxiety in task situations did not differ between the groups. Further, pedagogical support did not play a significant role in how primary school students perceived themselves, whereas in lower secondary school, significant differences were found in several areas. Finally, we found that the sources of self-efficacy in self-regulation and strengths were related in both primary and lower secondary school settings.

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Introduction

Schools have the important and challenging task of preparing students to grow into productive members of society (Anderson 2008). Consequently, identifying the abilities and skills that can be utilised to facilitate positive student interactions is a key focus of schools and educational systems (cf. Voogt and Roblin 2012). The need to support school-aged children's social and emotional skills, as well as their socialisation and cooperation skills, has been strongly highlighted in The Finnish National Core Curriculum for Basic Education (FNBE (Finnish National Board of Education) 2016). Previous studies have reported that students' perceptions of their abilities to regulate and assess their own behaviours, emotions and thinking strongly influence their social and emotional

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development (e.g. Bandura 1986, 1997; Joët, Usher, and Bressoux 2011; Kendall 2012; Lochman et al. 2012; Paananen et al. 2019; Zimmerman 2008). In this article, we use the term *self-perception* to refer to two important viewpoints of students' views of their own abilities and strengths: *sources of self-efficacy in self-regulation* (Bandura 1997; Joët, Usher, and Bressoux 2011; Paananen et al. 2019) and *behavioural and emotional strengths* (Epstein 2004; Lambert, Sointu, and Epstein 2019; Lappalainen et al. 2014). Understanding both of these together would especially help to support and educate students of different ages with varying pedagogical needs. According to Finnish National Institute for Health and Welfare (THL (Finnish Institute for Health and Welfare) 2021) statistics, identifying the support needs of school-aged children is crucial, as increasingly younger children experience strong symptoms of behavioural and emotional difficulties. Further, teachers and caregivers have reported fatigue related to students lacking the necessary skills to assess and regulate their emotions and behaviours in the face of adversity (Ikonen and Helakorpi 2019).

A novel understanding of how to support students in general, but also in relation to age and received pedagogical support, is needed. Further, our current understanding of younger and older students' perceptions of their sources of self-efficacy in self-regulation and behavioural and emotional strengths is limited. While these viewpoints of self-perceptions have a theoretical connection (cf. Bandura 1997), to the best of our knowledge, the empirical interconnectedness is still unknown. Therefore, the purpose of this study was to investigate not only how different-aged comprehensive school students perceive their sources of self-efficacy in self-regulation and their behavioural and emotional strengths, but also to see whether received pedagogical support plays a role in how students perceive themselves. In so doing, we sought to create new insights into the relationships between sources of self-efficacy in self-regulation and behavioural and emotional strengths.

Sources of self-efficacy in self-regulation

Students' self-efficacy in self-regulation is a construction of beliefs of one's own ability to regulate, control and assess behaviour, emotions and thinking in varying interactions (Bandura 1997; Joët, Usher, and Bressoux 2011; Paananen et al. 2019). Self-regulation is a process that enables individuals to control their own actions and behaviour (Zimmerman 2008). An important part of successful self-regulation in students comprises their beliefs about their ability to control and assess their own achievements, i.e. self-efficacy, with questions such as 'Can I?' (Zimmerman 2008). Students' self-efficacy to self-regulate significantly predicts not only learning (Blair and Raver 2015), but social and emotional development as well (Lochman et al. 2012; Kendall 2012).

Self-efficacy in self-regulation is developed through sources of information (Bandura 1997). Performances in the school context always occur amidst multiple streams of information, which can either empower or diminish students' accomplishments (Caprara et al. 2008). The extent to which students will adjust their perceived self-efficacy in self-regulation depends on how they interpret contextual information in learning situations (Määttä, Järvelä, and Perry 2016). One way to investigate students' self-efficacy in self-regulation is by using Bandura's (1997) social cognitive theory, wherein students' self-efficacy is constructed by four hypothesised sources of information. The first

two of these sources are operationalised in research as past experiences of one's own achievements (mastery experiences) and information about one's own position in relation to peers' actions (vicarious experiences). The next two are students' beliefs of received compliments (social persuasion) and emotional and physical experiences in on-task situations (physiological and emotional states).

Perceptions of these sources also affect what seems important to invest in, how to face difficulties in learning situations and what kinds of choices students make for the future (Bandura et al. 2003). Furthermore, the literature provides some evidence that age (Bandura 1997; Harter 2012) and pedagogical support (Klassen 2010; Paananen et al. 2019) can influence the ability of students to face challenging situations now and in the future. According to Bandura (1997) and Harter (2012), with age, students gather experiences from learning situations and interactions, developing more-differentiated perceptions of self-efficacy in self-regulation. In contrast, Paananen et al. (2019), focusing on students with attention and executive function difficulties, and Klassen (2010), focusing on students with learning disabilities, have reported lower source-related experiences for these individuals than for students without such difficulties or disabilities. In the Finnish educational system, these difficulties are commonly the reason for providing more intensifying pedagogical support. Previous studies suggest that students may vary in terms of age and received pedagogical support; thus, the existing research needs to be augmented with a greater understanding of the differentiation in source-related experiences among primary and lower secondary schools and in relation to pedagogical support.

Behavioural and emotional strengths

Another well-noticed and recently studied view for understanding students' self-perceptions are behavioural and emotional strengths, which are defined as control, skills, self-knowledge and self-confidence in different contexts and in interactions at home and school, as well as among peers (Epstein 2004; Sointu et al. 2018). Today, several approaches to strengths exist, e.g. positive psychology (Peterson and Seligman 2004) and positive youth development (e.g. Lerner et al. 2009). More specifically, the behavioural and emotional strength-based approach is frequently used in special education/mental health, and considers the notion of strengths from five dimensions: (1) one's own ability to control emotions and behaviours in social situations (interpersonal strengths), (2) relationships with family and close surroundings (family involvement), (3) a broad view of one's own competencies and achievements (intrapersonal strengths), (4) competencies in academic tasks (school functioning) and (5) one's own ability to accept and demonstrate both affection and emotions (affective strengths).

Behavioural and emotional strengths create perceptions of one's own skills, promotes relationships with peers and adults, empowers one to face difficulties and stress, and supports personal, social and academic development (Epstein 2004). Behavioural and emotional strengths bring to students the resources they need in order to understand the skills and competencies they already have, as well as how they can utilise those strengths in multiple learning and problem-solving situations and social interactions (Sointu et al. 2018; Barksdale, Azur, and Daniels 2010). Moreover, all children have the potential to learn and utilise their strengths if the school and home supports them (Epstein 2004; Lerner

et al. 2009). It is essential to investigate students' perceptions of their own strengths from their own points of view because students assess and experience skills and knowledge differently than adults (Achenbach and Rescorla 2007). School professionals need consistent means to identify and assess students' strengths in order to improve and diversify pedagogical assessments (cf. Heiskanen et al. 2019).

Identifying and assessing behavioural and emotional strengths among different-aged students and pedagogical needs are of great importance. In previous studies, lower secondary school-aged students in particular have reported lower strength beliefs than primary school students (Lambert et al. 2021). Additionally, students receiving intensifying support have been found to report lower strength perceptions than their peers receiving general support (Lappalainen et al. 2009), and these students have also been found to receive less positive feedback (Karhu, Närhi, and Savolainen 2019). Further, this may have contributed to strengths not being documented in pedagogical reviews (Heiskanen et al. 2019). Significantly, these strengths contribute to an individual's social and emotional development, supporting a sense of well-being and positive belief in one's own skills and competencies at present and in the future (Lappalainen et al. 2020).

Interconnectedness between the sources of self-efficacy in self-regulation and strengths

Students' self-perceptions are a foundation for educational and psychosocial development. To investigate self-perceptions, we need to acknowledge the preconceptions (e.g. doubts and confidence) students hold with regard to their accomplishments (Bandura 1997). Students vary in their preconceptions about their behaviours and emotions, and about how these will affect their performance (Bandura 1997). Therefore, one important perspective for investigating and supporting students' self-perceptions could be the use of sources of self-efficacy in self-regulation and behavioural and emotional strengths as complementary factors (Sointu et al. 2022). However, to the best of our knowledge, perceptions concerning the viewpoints of sources of self-efficacy in self-regulation and behavioural and emotional strengths have been studied separately, even though both could offer school professionals a more-nuanced perspective for identifying and supporting students' constructing positive self-perceptions in daily circumstances and problem-solving situations (e.g. Liew 2012).

Some evidence is provided in the literature that students' self-perceptions differ across age (Bandura 1997; Harter 2012; Lambert et al. 2021) and received pedagogical support (Klassen 2010; Lappalainen et al. 2009; Paananen et al. 2019). Students assess their own skills (Can I? Self-efficacy in self-regulation) in multiple situations on a daily basis, as well as their existing skills and knowledge (i.e. strengths) that could improve their task performance. On the other hand, perceptions may influence more than actual skills, as students who feel they have abilities are more likely than students who doubt themselves to succeed in school tasks (Bandura 1997), even though they have same skills. Therefore, it would be important to investigate what kind of perceptions students hold about themselves as learners in relation to age as well as to received pedagogical support, especially since identifying and utilising one's own skills and competencies has been seen to

empower students to take responsibility for decisions and events that affect their lives today as well as in the future (Epstein 2004).

The Finnish comprehensive education system consists of primary school, comprising six grades for students 7–12 years of age, and lower secondary school, comprising seventh through to ninth grades for students 13–16 years of age. One of the main aims of this system is to provide equal opportunities of education for all students (e.g. Sointu et al. 2022). In this regard, the Finnish pedagogical support system resembles the so-called three-tiered response to intervention (RTI) model (Jahnukainen and Itkonen 2016). In practice, the different tiers of RTI vary in intensity based on students' needs (e.g. Fuchs and Fuchs 2006). Thus, in the Finnish system, pedagogical support intensifies based on need, progressing from (1) general support, to (2) intensified support and then to (3) special (needs) support. According to the Finnish National Board of Education (FNBE (Finnish National Board of Education) 2016), general support means pedagogical guidance and support measures that aim to improve students at an early stage. More *intensifying support*, which includes *intensified support*, involves support that is pedagogically assessed and provided on the basis of needs (e.g. for school attendance and behavioural challenges), while *special support* requires a more thorough statement about a student's pedagogical situation, including a plan of appropriate pedagogical strategies (FNBE (Finnish National Board of Education) 2016).

Thus, the purpose of this study was to investigate comprehensive school students' self-assessed perceptions of their sources of self-efficacy in self-regulation and behavioural and emotional strengths. More specifically, we investigated whether (1) there were statistically significant differences between primary and lower secondary school students with regard to these constructs, (2) there were statistically significant differences between (2.1) primary school and (2.2) lower secondary school students receiving general and intensifying support (i.e. intensified and special support together), and (3) how strongly sources of self-efficacy in self-regulation and behavioural and emotional strengths correlate among primary and lower secondary schools students, and if differences exist.

Materials and methods

Participants and procedures

The convenience sample included 599 comprehensive school students from Eastern Finland (age 9–16 years, $M_{\text{age}} = 12.37$, $SD_{\text{age}} = 1.68$, 51.9% girls), of which 322 were primary school students from grades 4 to 6 (53.4% girls) with a mean age of 11.05 years ($SD_{\text{age}} = 0.88$), and 19.9% ($n = 64$) received intensified or special support. Further, 277 were lower secondary school students from grades 7 to 9 (50.2% girls), with a mean age of 13.90 years ($SD_{\text{age}} = 0.90$), of which 9.7% ($n = 27$) received intensified or special support. Students' educational support information was received from schools, comprising general, intensified and special support. Although the participants were selected using a convenience sampling approach, based on the official statistics of Finland (Statistics Finland 2020), the sample demographic characteristics of the participants were representative of Finnish schools. For this study, we combined students with *intensified* and *special support* in the same group to represent *intensifying support*.

This study was conducted as a part of the TUVET/KTVA//#Bestschool project in the fall of 2019. First, the schools' principals and teachers were contacted, and the project was explained to them, after which teachers' consent was sought for voluntary participation. Second, an information letter and video describing the purpose of the project was sent to all of the caregivers of children whose teachers had already agreed to participate in the research collaboration. The EU GDPR (2016/679) and national Data Protection Act (1050/2018), as well as Finnish National Board on Research Integrity (TENK) guidelines for the ethical principles of research with human participants (TENK (Finnish National Advisory Board on Research Ethics) 2009), were strictly followed in all research team procedures, and the participation by caregivers and students was voluntary. Third, students responded to the electronic questionnaires voluntarily during a school day, under the supervision of the trained research team.

Measures

Data for students' sources of self-efficacy in self-regulation were collected using a Finnish-language version of the Sources of Self-Regulatory Self-Efficacy questionnaire (Paananen et al. 2019), which was translated from the original Usher and Pajares (2008) questionnaire based on Bandura's (1997) theory. For the behavioural and emotional strengths, the Finnish Behavioural and Emotional Rating Scale 2 (BERS-2; Sointu et al. 2018), which was translated from the original BERS-2 (Epstein 2004), was used.

The Sources of Self-Regulatory Self-Efficacy questionnaire includes four subscales: (1) mastery experiences (e.g. I have always been able to focus on tasks during class), (2) vicarious experiences (e.g. My friends are able to focus on tasks during class), (3) social persuasion (e.g. My teacher said that I pay attention to teaching during class) and (4) physiological and emotional states (e.g. I feel nervous when I do my homework). Students responded to the 17-item questionnaire using a five-point Likert-type scale (1 = never true; 5 = always true). Scores for the original questionnaire have demonstrated adequate validity and reliability in Finland (Paananen et al. 2019). In this study, the internal consistency varied from $\alpha = .83$ (physiological and emotional state) to $\alpha = .94$ (mastery experiences), indicating appropriate reliability ($\alpha > .70$; Nunnally and Bernstein 1994). However, we were not able to replicate the vicarious experiences scale ($\alpha = .58$) in our study with adequate reliability, and thus we had to remove it from the analysis (including 5 items).

BERS-2 includes five subscales: (1) Interpersonal strengths (e.g. I can deal with being told 'no'), (2) Intrapersonal strengths (e.g. I believe in myself), (3) Family involvement (e.g. I get along well with my family), (4) School functioning (e.g. I pay attention in class) and (5) Affective strengths (e.g. I let people know when I like them). These subscales can also be combined into an overall Strength Index score that represents the overall behavioural and emotional strengths of students (Epstein 2004). Students rated 52 items using a four-point Likert-type scale (0 = not at all like you; 3 = very much like you). The BERS-2 has been used internationally (e.g. Lambert, Sointu, and Epstein 2019) and in Finland. Particularly, the Finnish translation for BERS-2 has demonstrated adequate validity and reliability in general (Sointu 2014; Sointu et al. 2012, 2017), varying in this study from $\alpha = .72$ (family involvement) to a Strength Index of $\alpha = .94$, indicating appropriate internal consistency ($\alpha > .70$; Nunnally and Bernstein 1994).

Data analysis

First, independent sample *t*-tests were conducted to compare mean differences in sources of self-efficacy in self-regulation and behavioural and emotional strengths between students in (1) primary and lower secondary school, and (2) general support and intensifying support. Due to possible violations of variance equality and normal distribution assumptions, we used bootstrapped standard errors to determine the statistical significance of the mean differences (Field 2018). Standard errors were based on 1000 bootstrapped replications. Cohen's *d* effect size (Cohen 1988) were used to summarise differences between the groups. Cohen's *d* estimates were computed using unadjusted mean and variances, and interpreted using Lenhard's and Lenhard's (2016) magnitude guidelines: small (0.2–0.49), intermediate (0.5–0.79) and large effect (≥ 0.8). The independent sample *t*-tests were used for research aims 1 and 2, indicated above.

Second, Pearson's correlation (*r*) coefficients were used to measure the direction and linear relationship between primary and lower secondary school students' perceptions of their sources of self-efficacy and behavioural and emotional strengths. Practical relationships in behavioural science tend to have correlations coefficients ranging from $r < .30$ to $< .90$, and correlation can be interpreted in the following manner: weak ($r = 0.1 \leq 0.30$), moderate ($r = 0.30 \leq 0.50$) or strong ($r \geq 0.50$) (Cohen 1988). Furthermore, Fischer's Z-tests (McNemar 1969) were used to test the significance of the difference between primary and lower secondary school correlation coefficients.

Results

The results in Table 1 indicate statistically significant differences between primary and lower secondary school students on measures of sources of self-efficacy in self-regulation on two subscales: mastery experiences ($p = .001$) and social persuasion ($p = .001$).

However, no statistically significant difference between the groups was found in the physiological and emotional states. In behavioural and emotional strengths, all of the differences were statistically significant: interpersonal strengths ($p = .022$), family involvement ($p = .001$), intrapersonal strengths ($p = .002$), school functioning ($p = .001$), affective

Table 1. Differences between primary and lower secondary school students' sources of self-efficacy in self-regulation and behavioural and emotional strengths.

	Primary (<i>n</i> = 322)		Lower secondary (<i>n</i> = 277)		Bootstrapped <i>t</i> -tests			
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)	<i>M</i> difference	<i>SE</i>	<i>p</i>	<i>d</i>
Mastery experience	4.14	(0.66)	3.87	(0.86)	0.27	0.06	.001	0.36
Social persuasion	3.75	(0.94)	3.46	(1.08)	0.29	0.08	.001	0.28
Physiological and emotional states	2.53	(1.15)	2.70	(1.14)	−0.17	0.09	.075	0.15
Interpersonal strengths	2.40	(0.37)	2.33	(0.34)	0.07	0.03	.022	0.20
Family involvement	2.47	(0.34)	2.35	(0.40)	0.12	0.03	.001	0.33
Intrapersonal strengths	2.51	(0.36)	2.40	(0.40)	0.11	0.03	.002	0.29
School functioning	2.39	(0.42)	2.20	(0.48)	0.19	0.04	.001	0.42
Affective strengths	2.27	(0.47)	2.18	(0.48)	0.09	0.04	.027	0.19
Strength index	2.42	(0.32)	2.30	(0.34)	0.12	0.03	.001	0.36

M = Mean, *SD* = Standard Deviation, *p* = significance, *d* = Cohen's *d*. Bootstrapping was used in *t*-tests. Mastery experience to Physiological and emotional states were rated with 1 = never true, 5 = always true; Interpersonal strengths to Strength index were rated with 3 = very much like you, 0 = not at all like you.

strengths ($p = .027$) and strength index ($p = .001$). Effect sizes were small for all statistically significant differences ($d = 0.15$ – 0.42). The results indicate that primary school students' perceptions of their sources of self-efficacy in self-regulation and strengths are generally more positive than those of lower secondary school students. Table 2.1. Reports the differences between primary school students' perceptions on measures of sources of self-efficacy in self-regulation and behavioural and emotional strengths.

Table 2.1. Differences between primary school students' sources of self-efficacy in self-regulation and behavioural and emotional strengths in relation to educational support.

Primary school	General support ($n = 258$)		Intensifying support ($n = 64$)		Bootstrapped t -tests			
	M	(SD)	M	(SD)	M difference	SE	p	d
Mastery experience	4.16	(0.61)	4.04	(0.81)	0.12	0.11	.279	−0.18
Social persuasion	3.75	(0.91)	3.79	(1.05)	−0.04	0.15	.732	0.04
Physiological and emotional states	2.48	(1.11)	2.75	(1.30)	−0.27	0.18	.136	0.24
Interpersonal	2.40	(0.35)	2.40	(0.43)	0.00	0.06	.972	0
Family involvement	2.48	(0.34)	2.47	(0.38)	0.01	0.05	.933	−0.03
Intrapersonal	2.51	(0.36)	2.52	(0.38)	−0.01	0.05	.805	0.03
School functioning	2.40	(0.40)	2.34	(0.49)	0.06	0.06	.428	−0.14
Affective strength	2.27	(0.45)	2.29	(0.52)	−0.02	0.07	.852	0.04
Strength index	2.42	(0.31)	2.41	(0.36)	0.01	0.05	.902	−0.03

M = Mean, SD = Standard Deviation, p = significance, d = Cohen's d . Bootstrapping was used in t -tests.

Students were divided into two groups based on their pedagogical support: students receiving general support and students receiving intensifying support. Results indicate that no statistically significant differences were found in the sources of self-efficacy in self-regulation and behavioural and emotional strengths in primary school between general and special support groups.

The following results in Table 2.2 interpret the differences between lower secondary school students' perceptions on measures of sources of self-efficacy in self-regulation and behavioural and emotional strengths. Students were divided into two groups based on their pedagogical support: general support and intensifying support. Results showed statistically significant ($p < .05$) differences in mastery experiences, physiological and emotional states, interpersonal strengths, school functioning and strength index subscales between general and special support groups.

Correlations are presented in Table 3. Correlations for the sources of self-efficacy in self-regulation and behavioural and emotional strengths are divided into two groups: the lower diagonal pertains to primary school students, and the upper diagonal to lower secondary school students. The majority of correlation coefficients were statistically significant, ranging from weak ($0.1 \leq 0.30$) to strong (≥ 0.50). For primary and lower secondary school students, the physiological and emotional states (e.g. stress and anxiety) subscale did not correlate or negatively correlated with all other subscales, ranging from -0.01 to -0.31 . However, intrapersonal strengths (e.g. selfcare) and strength index (all behavioural and emotional strengths combined into one subscale) were significantly correlated with all other subscales among both primary and lower secondary school students.

Results indicate that the sources of self-efficacy in self-regulation and behavioural and emotional strengths generally correlated significantly between primary and lower

Table 2.2. Differences between lower secondary school students' sources of self-efficacy in self-regulation and behavioural and emotional strengths in relation to educational support

	General support (<i>n</i> = 250)		Intensifying support (<i>n</i> = 27)		Bootstrapped <i>t</i> -tests			
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)	<i>M</i> difference	<i>SE</i>	<i>p</i>	<i>d</i>
<i>Lower secondary school</i>								
Mastery experience	3.91	(0.86)	3.53	(0.87)	0.38	0.18	0.04	0.44
Social persuasion	3.50	(1.08)	3.14	(1.10)	0.36	0.22	0.08	0.33
Physiological and emotional states	2.76	(1.15)	2.14	(0.88)	0.62	0.18	0.00	0.55
Interpersonal	2.34	(0.34)	2.19	(0.32)	0.15	0.06	0.02	0.44
Family involvement	2.36	(0.38)	2.25	(0.51)	0.11	0.10	0.24	0.28
Intrapersonal	2.41	(0.40)	2.32	(0.42)	0.09	0.08	0.27	0.22
School functioning	2.22	(0.47)	1.97	(0.47)	0.25	0.10	0.01	0.53
Affective strength	2.21	(0.46)	1.99	(0.56)	0.22	0.11	0.06	0.47
Strength index	2.23	(0.33)	2.16	(0.37)	0.07	0.07	0.03	0.21

Table 3. Correlation coefficients of sources of self-efficacy in self-regulation and behavioural and emotional strengths between primary and lower secondary school students.

	1	2	3	4	5	6	7	8	9
1 Mastery experience		.67***, ¹	-.05	.52***	.51***, ¹	.50***, ¹	.80***, ¹	.41***, ¹	.67***, ¹
2 Social persuasion	.58***, ¹		-.03	.55***	.60***	.55***, ¹	.69***	.45***	.69***, ¹
3 Physiological and emotional states	-.15**	-.07		-.11	-.19**	-.31***, ¹	-.01	-.09	-.18***
4 Interpersonal strengths	.50***	.44***	-.18**		.55***	.61***	.63***	.55***	.83***
5 Family involvement	.38***, ¹	.53***	-.10	.63***		.74***, ¹	.57***	.56***	.82***
6 Intrapersonal strengths	.35***, ¹	.42***, ¹	-.21***, ¹	.67***	.67***, ¹		.57***	.71***	.88***
7 School functioning	.74***, ¹	.56***	-.18**	.64***	.51***	.55***		.51***	.80***
8 Affective strengths	.29***, ¹	.40***	-.04	.63***	.60***	.68***	.42***		.79***
9 Strength index	.55***, ¹	.56***, ¹	-.18**	.89***	.81***	.86***	.76***	.79***	

Lower diagonal comprises primary school (*n* = 322), upper diagonal comprises lower secondary school (*n* = 277). Values on cells are Pearson's correlations coefficients. Correlation significance, **p* < 0.05, ***p* < 0.01, ****p* < 0.001. ¹For the significant correlation (*p* < 0.05) differences of correlation based on Fisher's Z-test.

secondary school. Thus, physiological and emotional states did not correlate on a primary school scale with family involvement and affective strengths, nor on lower secondary school scale with intrapersonal strengths, school functioning and affective strengths. In general, correlations are positive, except for physiological and emotional states. Further, Fischer's Z-test was conducted to test the significance (see table 3 for ¹) of the difference between primary and lower secondary school students' correlation coefficients. Interestingly, all of the correlation coefficients that significantly differed had stronger correlations among lower secondary school students.

Discussion

The purpose of this study was to investigate how comprehensive school students who differ in age and in need for pedagogical support perceive their sources of self-efficacy in self-regulation and behavioural and emotional strengths, and whether these perceptions are related. Identifying and utilising students' own skills and competencies has been seen to empower their self-perceptions as well as their desire to take responsibility for

decisions influencing their daily lives both now and in the future (Epstein 2004). Previously, self-efficacy in self-regulation and behavioural and emotional strengths self-perceptions have been investigated separately. Even though these two elements theoretically share the same foundation (cf. Bandura 1997), empirical interconnectedness remains vague.

First, we analysed how primary and lower secondary school students perceive their sources of self-efficacy in self-regulation and behavioural and emotional strengths. The results indicate that primary and lower secondary school students' perceptions are generally differentiating, as primary school students reported higher perceptions than lower secondary school students in mastery experience, social persuasion and in all behavioural and emotional strengths. These findings are in line with those of previous studies, specifically, that students' perceptions vary over time (Harter 2012; Lambert et al. 2021), that differentiations of perceptions can be related to experiences of one's own abilities and control which student gather over time by widening their self-reflection into diverse learning situations and school environment (Bandura 1997; FNBE (Finnish National Board of Education) 2016). Additionally, Lappalainen et al. (2020) found that lower secondary school students may not receive as much support to identify and utilise their own abilities in school and at home, which can contribute to lower secondary school students reporting lower self-perceptions. Interestingly, school-level groups did not differ in experiencing physiological and emotional states (i.e. stress and anxiety). Students might have experienced and interpreted these states differently, as a sign of positive stress feedback related to the importance of the task or as a fear of failure related to the task (Bandura 1997).

Second, our findings showed that primary school students receiving either general or intensifying (i.e. intensified and special) support did not differ in how they perceived their sources of self-efficacy in self-regulation and behavioural and emotional strengths. These results might be connected to the Finnish inclusive school system, which strives to support all students' beliefs about themselves, regardless of pedagogical needs (Jahnukainen and Itkonen 2016) in the early years. Moreover, school providers, schools and teachers are guided by national core curriculum guidelines in emphasising identification and support of primary school students' strengths and self-perceptions in learning (FNBE (Finnish National Board of Education) 2016). However, there was differentiation in the results among lower secondary school students: students with general support perceived their sources of self-efficacy in self-regulation and behavioural and emotional strengths more positively than students receiving intensifying support in seven out of nine investigated constructs. This is in line with the notion of previous research (Paananen et al. 2019) that students with intensifying pedagogical support needs are experiencing unfavourable cycle, where they have gained fewer positive learning experiences, which in turn leads to lower self-perceptions of their own abilities and skills (Usher and Pajares 2008) and, further, to negative learning paths (Baker and Wigfield 1999) over time. Lower secondary school-level students in particular are in a phase where individuals have already acquired many different learning experiences and have become more aware of their surroundings (e.g. social comparison of peers), so that the possible cumulative negative perceptions become more evident in students' self-perceptions. In turn, the transition from primary to lower secondary school may influence individual outcomes. For instance, the subject teacher system exists in the lower secondary level context, where students have a more intensive learning pace and longer school days. For those students

with greater need for intensifying support, this may cause cumulative negative self-perceptions at the lower secondary school level.

Finally, our results showed that the sources of self-efficacy in self-regulation and behavioural and emotional strengths were, in most cases, positively related with each other in both primary and lower secondary school. Only the associations between physiological and emotional states (i.e. nervousness and worries in learning) and other constructs were negative due to the measuring of students' perceptions of their nervousness and worries concerning learning situations, while other constructs reflected more positive experiences. These empirical results are in line with the theoretical suggestions of Bandura (1997), as stronger sources of self-efficacy in self-regulation are associated with stronger behavioural and emotional strengths. To our knowledge, this is the first attempt to empirically study these possible associations. Interestingly, even though the relations were mostly significant in both primary and lower secondary schools, the results indicated even stronger relations in lower secondary school. These findings might relate to previous suggestions that younger students' self-perceptions are less differentiated (Bandura 1997) because individual development becomes more precise over time (cf. Harter 2012). These results lead us back to the theoretical suggestion that the sources of self-efficacy in self-regulation and behavioural and emotional strengths share a foundation, occurring in the results as connections in primary school and further strengthening among lower secondary school students, as they have not only gathered multiple learning experiences, but also have learned to assess their behavioural and emotional skills.

Additionally, our results concerning the sources of self-efficacy in self-regulation subscale's *physiological and emotional states* were somewhat surprising. Primary and lower secondary school students perceived their stress and anxiety in on-task situations similarly, but lower secondary school students receiving general support reported higher stress and anxiety than their peers with intensifying support. This finding differs from previous studies suggesting that students with intensifying support reported higher stress and anxiety experiences than students with general support (Paananen et al. 2019; Usher and Pajares 2008). It is possible that our result reflects the fact that students receiving intensifying support in their learning also simultaneously receive support for dealing with feelings of stress and anxiety, whereas other students do not receive this kind of support in their studies. It might also be connected to the different ways students interpret nervousness and stress. Perceptions are seen to be influenced by previous *mastery experiences* (Bandura 1997; Usher and Pajares 2008), and therefore these interpretations of physiological and emotional experiences can be viewed as a sign of either (1) a positive stress feedback related to the importance, for the student, of succeeding in the task, or as (2) a negative stress feedback related to the student's fear or anxiety with regard to failing in the task (Bandura 1997). However, we found that in our results, mastery experience and physiological and emotional states had connections only among primary school students, not in lower secondary school students. Therefore, our results of higher stress and anxiety experiences among students receiving general support in lower secondary school might not relate to past mastery experiences, but to something else that we need to explore in our future studies. Further research is thus warranted.

Limitations and future research

There are limitations to this study. First, participants were from one region of Finland. However, Finnish schools have low between-school variances (2%–5%) (Hautamäki et al. 2013), and this may diminish the concern of representativeness. Still, larger and more representative data are required in the future – both in Finland and internationally – in order to examine the longitudinal relations of these constructs, so we can better understand whether affecting a certain construct could possibly support another one and, in the process, support students' positive self-perceptions as a learner. Second, data were convenience sample, which must be noted. Random samples should be used in future research. Third, students receiving intensifying (i.e. intensified and special) support were analysed as one group. Future research should collect large-enough data to implement a three-tiered RTI model in order to understand the phenomena better. Fourth, descriptive analyses were used. However, this type of research is warranted to understand the interconnectedness of sources of self-efficacy in self-regulation and behavioural and emotional strengths related to school levels and pedagogical support. Nevertheless, future research should continue to investigate these constructs using stronger methodological approaches, including longitudinal data. Furthermore, given the foundation of the investigated constructs, a more in-depth understanding should be gained via qualitative approaches.

Conclusion

Our research indicates that students in primary and lower secondary schools interpret learning situations differently in relation to age, but also in relation to pedagogical support. Additionally, results revealed that the theoretical connection between the sources of self-efficacy in self-regulation and behavioural and emotional strengths can be found empirically. As these kinds of self-perceptions have been found to play a critical role in students' learning and academic performance (Liew 2012), these findings highlight the need for a better understanding of the differences and interconnections of these perceptions among students in various age groups and with different kinds of pedagogical needs. This information provides new insights for researchers and school professionals alike, with the latter having a particular demand for tools to help them identify students' individual needs, not only in terms of difficulties, but also skills and abilities to support students.

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Disclosure statement

Two of the authors of this paper (i.e., Sointu, Lambert) are authors of one assessment instruments (i.e., Finnish Behavioral and Emotional Rating Scale 2) used in the study.

References

- Achenbach, T. M., and L. R. Rescorla. 2007. *Multicultural Understanding of Child and Adolescent Psychopathology: Implications for Mental Health Assessment*. New York: Guilford Press.
- Anderson, R. E. 2008. "Implications of the Information and Knowledge Society for Education." J. Voogt and G. Knezek edited by *International Handbook of Information Technology in Primary and Secondary Education*. Vol. 20. Springer 5–22 : Boston, MA. [10.1007/978-0-387-73315-9_1](https://doi.org/10.1007/978-0-387-73315-9_1)
- Baker, L., and A. Wigfield. 1999. "Dimensions of Children's Motivation for Reading and Their Relations to Reading Activity and Reading Achievement." *Reading Research Quarterly* 34 (4): 452–477. doi:[10.1598/RRQ.34.4.4](https://doi.org/10.1598/RRQ.34.4.4).
- Bandura, A. 1986. *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. 1997. *Self-Efficacy: The Exercise of Control*. New York: W. H. Freeman.
- Bandura, A., G. V. Caprara, C. Barbaranelli, M. Gerbino, and C. Pastorelli. 2003. "Role of Affective Self-Regulatory Efficacy in Diverse Spheres of Psychosocial Functioning." *Child Development* 74 (3): 769–782. doi:[10.1111/1467-8624.00567](https://doi.org/10.1111/1467-8624.00567).
- Barksdale, C. L., M. Azur, and A. M. Daniels. 2010. "Behavioral and Emotional Strengths among Youth in Systems of Care and the Effect of Race/Ethnicity." *Journal of Emotional and Behavioral Disorders* 18 (4): 236–246. doi:[10.1177/1063426609351700](https://doi.org/10.1177/1063426609351700).
- Blair, C., and C. C. Raver. 2015. "School Readiness and Self-Regulation: A Developmental Psychobiological Approach." *Annual Review of Psychology* 66 (1): 711–731. doi:[10.1146/annurev-psych-010814-015221](https://doi.org/10.1146/annurev-psych-010814-015221).
- Caprara, G. V., R. Fida, M. Vecchione, G. Del Bove, G. M. Vecchio, C. Barbaranelli, and A. Bandura. 2008. "Longitudinal Analysis of the Role of Perceived Self-Efficacy for Self-Regulated Learning in Academic Continuance and Achievement." *Journal of Education & Psychology* 100 (3): 525. doi:[10.1037/0022-0663.100.3.525](https://doi.org/10.1037/0022-0663.100.3.525).
- Cohen, J. 1988. *Statistical Power Analysis for the Behavioral Sciences*. New York: Routledge.
- Epstein, M. H. 2004. *Behavioral and Emotional Rating Scale: A Strength-Based Approach to Assessment*. 2nd ed. Austin, TX: PRO-Ed.
- Field, A. 2018. *Discovering Statistics Using IBM SPSS Statistics*. 5th ed. New York: SAGE.
- FNBE (Finnish National Board of Education). 2016. *National Core Curriculum for Basic Education*. Helsinki: FNBE.
- Fuchs, D., and L. S. Fuchs. 2006. "Introduction to Response to Intervention: What, Why, and How Valid Is It?" *Reading Research Quarterly* 41 (1): 93–99. doi:[10.1598/RRQ.41.1.4](https://doi.org/10.1598/RRQ.41.1.4).
- Harter, S. 2012. "Emerging Self-Processes during Childhood and Adolescence." In *Handbook of Self and Identity*, edited by M. R. Leary and J. P. Tangney, 680–715. New York, NY: Guilford Press.
- Hautamäki, J., S. Kupiainen, J. Marjanen, M. Vainikainen, and R. Hotulainen. 2013. "Oppimaan Oppiminen Peruskoulun Päättövaiheessa. Tilanne Vuonna 2012 Ja Muutos Vuodesta 2001 [Learning to Learn at the End of Basic Education." In *Results in 2012 and Changes from 2001*. Helsinki: Helsingin yliopisto. Department of Teacher Education Research Report No 347.
- Heiskanen, N., T. Saxlund, A. Rantala, and T. Vehkakoski. 2019. "Lapsen Vahvuudet Esiopetusvuoden Pedagogisissa Asiakirjoissa [Child's Strengths in pre-primary Education Pedagogical Documents." *Oppimisen ja oppimisvaikeuksien erityislehti: NMI-bulletin* 29 (1): 26–42.
- Ikonen, R., and S. Helakorpi. 2019. *Well-Being of Children and Young People – School Health Promotion Study 2019*. Helsinki: Finnish Institute for Health and Welfare. https://www.julkari.fi/bitstream/handle/10024/138562/Tilastoraportti_33_Kouluterveyskysely.pdf?sequence=2&isAllowed=y.
- Jahnukainen, M., and T. Ikonen. 2016. "Tiered Intervention: History and Trends in Finland and the United States." *European Journal of Special Needs Education* 31 (1): 140–150. doi:[10.1080/08856257.2015.1108042](https://doi.org/10.1080/08856257.2015.1108042).
- Joët, G., E. L. Usher, and P. Bressoux. 2011. "Sources of Self-Efficacy: An Investigation of Elementary School Students in France." *Journal of Educational Psychology* 103 (3): 649–663. doi:[10.1037/a0024048](https://doi.org/10.1037/a0024048).

- Karhu, A., V. Närhi, and H. Savolainen. 2019. "Check In–Check Out Intervention for Supporting Pupils' Behaviour: Effectiveness and Feasibility in Finnish Schools." *European Journal of Special Needs Education* 34 (1): 136–146. doi:10.1080/08856257.2018.145214.
- Kendall, P. C. 2012. "Guiding Theory for Therapy with Children and Adolescents." In *Child and Adolescent Therapy*, edited by P. C. Kendall, 61–91. New York: Guilford Press.
- Klassen, R. M. 2010. "Confidence to Manage Learning: The Self-Efficacy for Self-Regulated Learning of Early Adolescents with Learning Disabilities." *Learning Disability Quarterly* 33 (1): 19–30. doi:10.1177/073194871003300102.
- Lambert, M. C., S.-A.-A. January, J. E. Gonzalez, M. H. Epstein, and J. Martin. 2021. "Comparing Behavioral and Emotional Strengths of Students with and without Emotional Disturbance." *Journal of Psychoeducational Assessment* 39 (8): 999–1014. doi:10.1177/07342829211038451.
- Lambert, M. C., E. T. Sointu, and M. H. Epstein. 2019. "A Comprehensive Review of International Research Using the Behavioral and Emotional Rating Scale." *International Journal of School and Educational Psychology* 7 (3): 215–226. doi:10.1080/21683603.2017.1422061.
- Lappalainen, K., H. Savolainen, M. Kuorelahti, and M. H. Epstein. 2009. "An International Assessment of the Emotional and Behavioral Strengths of Youth." *Journal of Child and Family Studies* 18 (6): 746–753. doi:10.1007/s10826-009-9287-5.
- Lappalainen, K., H. Savolainen, E. T. Sointu, and M. H. Epstein. 2014. "Cross-Informant Agreement and Stability of the Strengths and Difficulties Questionnaire among Finnish Mainstream and Special Education Students." *International Journal of School & Educational Psychology* 2 (1): 27–31. doi:10.1080/21683603.2013.848177.
- Lappalainen, K., V. Vellonen, P. Linjala, A.-K. Blå, and R. Hotulainen. 2020. "Vahvuuksia Tunnistamalla Toiveammattiin – Yläluokilla Käyttäytymisen Tai tunne-elämän Ongelmiin Tukea Tarvinneiden Nuorten Koulutuspolut Ja Tukikokemukset [By Identifying Strengths Towards a Dream Profession – Educational Paths, Strengths and Support Experiences of Secondary School Students with Behavioral or Emotional Support Needs." *Kasvatus* 51 (5): 546–577.
- Lenhard, W., and A. Lenhard. 2016. *Calculation of Effect Sizes*. Dettelbach, Germany: Psychometrica. https://www.psychometrica.de/effect_size.html.
- Lerner, J. V., E. Phelps, Y. E. Forman, and E. Bowers. 2009. "Positive Youth Development." In *Handbook of Adolescent Psychology*, edited by R. M. Lerner and L. Steinberg, 524–558. Hoboken, NJ: Wiley.
- Liew, J. 2012. "Effortful Control, Executive Functions, and Education: Bringing Self-Regulatory and Social-Emotional Competencies to the Table." *Child Development Perspectives* 6 (2): 105–111. doi:10.1111/j.1750-8606.2011.00196.x.
- Lochman, J. E., N. R. Powell, J. M. Whidby, and D. P. FitzGerald. 2012. "Aggression in Children." In *Child and Adolescent Therapy*, edited by P. C. Kendall, 27–60. New York: Guilford Press.
- Määttä, E., S. Järvelä, and N. Perry. 2016. "Personal and Contextual Contributors to Young Children's Activity-Based Perceived Self-Efficacy." *Scandinavian Journal of Educational Research* 60 (4): 417–434. doi:10.1080/00313831.2015.1024161.
- McNemar, Q. 1969. *Psychological Statistics*. 4th ed. New York: John Wiley and Sons.
- Nunnally, B. H., and J. C. Bernstein. 1994. *Psychometric Theory*. London: McGraw-Hill.
- Paananen, M., T. Aro, H. Viholainen, T. Koponen, A. Tolvanen, J. Westerholm, and M. Aro. 2019. "Self-Regulatory Efficacy and Sources of Efficacy in Elementary School Pupils: Self-Regulatory Experiences in Population Sample and Pupils with Attention and Executive Function Difficulties." *Learning and Individual Differences* 70: 53–61. doi:10.1016/j.lindif.2019.01.003.
- Peterson, C., and M. E. Seligman. 2004. *Character Strengths and Virtues: A Handbook and Classification*. New York: American Psychological Association (APA) and Oxford University Press.
- Sointu, E. T. 2014. "Multi-informant Assessment of Behavioral and Emotional Strengths." PhD diss., University of Eastern Finland.
- Sointu, E. T., H. Savolainen, K. Lappalainen, and M. Epstein. 2012. "Parent, Teacher and Student Cross Informant Agreement of Behavioral and Emotional Strengths: Students with and without Special Education Support." *Journal of Child and Family Studies* 21 (4): 682–690. doi:10.1007/s10826-011-9520-x.

- Sointu, E., H. Savolainen, K. Lappalainen, M. Kuorelahti, R. Hotulainen, V. Närhi, M. C. Lambert, and M. H. Epstein. 2018. *Käyttötymisen ja tunteiden vahvuuksien arviointiväline*. Finnish Behavioral and Emotional Rating Scale – 2. Jyväskylä: PS-Kustannus.
- Sointu, E. T., H. Savolainen, K. Lappalainen, and M. C. Lambert. 2017. "Longitudinal Associations of Student–Teacher Relationships and Behavioural and Emotional Strengths on Academic Achievement." *Educational Psychology* 37 (4): 457–467. doi:10.1080/01443410.2016.1165796.
- Sointu, E., K. Waltzer, J. Pursiainen, A. Äikäs, and K. Lappalainen. 2022. "Behaviour Management in Finland." In *Contemporary Approaches to Behaviour and Mental Health in the Classroom. Weaving Together Theory, Practice, Policy and Educational Discourse*, edited by E. Clarke, 176–201. London: Routledge. doi:10.4324/9781003035527.
- Statistics Finland. 2020. *Official Statistics of Finland: Support for Learning*. Helsinki: Statistics Finland. http://www.stat.fi/til/erop/2020/erop_2020_2021-06-08_tie_001_en.html.
- TENK (Finnish National Advisory Board on Research Ethics). 2009. *Ethical Principles of Research in the Humanities and Social and Behavioural Sciences: Finnish National Board on Research Integrity Guidelines 2009*. Helsinki: TENK 1–17 . <https://tenk.fi/sites/tenk.fi/files/ethicalprinciples.pdf>
- THL (Finnish Institute for Health and Welfare). 2021. "Well-Being of Children and Young People." *School Health Promotion Study*. <https://thl.fi/en/web/thlfi-en/statistics-and-data/statistics-by-topic/social-services-children-adolescents-and-families/well-being-of-children-and-young-people-school-health-promotion-study>
- Usher, E. L., and F. Pajares. 2008. "Sources of Self-Efficacy in School: Critical Review of the Literature and Future Directions." *Review of Educational Research* 78 (4): 751–796. doi:10.3102/0034654308321456.
- Voogt, J., and N. P. Roblin. 2012. "A Comparative Analysis of International Frameworks for 21st Century Competences: Implications for National Curriculum Policies." *Journal of Curriculum Studies* 44 (3): 299–321. doi:10.1080/00220272.2012.668938.
- Zimmerman, B. J. 2008. "Investigating Self-Regulation and Motivation: Historical Background, Methodological Developments, and Future Prospects." *American Educational Research Journal* 45 (1): 166–183. doi:10.3102/0002831207312909.