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# **A Systematic Review of Longitudinal Changes in School Burnout among Adolescents: Trajectories, Predictors, and Outcomes**

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Data sharing is not applicable in this article as no new data were created or analyzed in this study.

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# A Systematic Review of Longitudinal Changes in School Burnout among Adolescents: Trajectories, Predictors, and Outcomes

## Abstract

**Introduction:** School burnout (SBO) is a public health issue with possible long-term consequences that occurs among developing adolescents. To design prevention policies, SBO's causes and consequences must be established. Moreover, a better understanding of its development might help identify key moments for interventions. Longitudinal studies can reveal whether SBO changes or remains stable over time and can track how its different dimensions develop. They can also clarify the distinction between the predictors and outcomes of SBO.

**Methods:** This systematic review follows PRISMA guidelines and aims to synthesize knowledge about the development of SBO and its predictors and outcomes. We queried databases for articles published between January 2002 and February 2021 that use a quantitative assessment of SBO and have longitudinal designs using students in secondary education.

**Results:** Forty-three articles representing 48 studies were included in this review. The results indicate that SBO tends to increase during secondary education, but most students display adjusted trajectories. Exhaustion is the first dimension of SBO to develop. The most-documented risk factors are female gender and high school academic track. Exhaustion is the first dimension of SBO to develop. The most-documented risk factors are female gender and high school academic track. Relationships with parents serve as a protective factor. Outcomes of SBO include lower engagement at school, impaired identity development, and lower satisfaction with life. Complex relationships are found between SBO, problematic use of internet, problematic use of social media, and depressive symptoms. The three are likely to be caused by SBO but probably develop in vicious cycles.

**Conclusion:** More research on the organizational factors influencing SBO in diverse educational systems is needed.

*Keywords: systematic review, adolescents, school burnout, secondary education, longitudinal*

## Introduction

Research on burnout originally focused on the working context, especially in human services professions (Freudenberger, 1975; Maslach, 1976). However, burnout is now regarded as a phenomenon that can be connected to any activity that generates chronic stress. It is considered a psychological syndrome that can lead to various outcomes, including depression (Hakanen et al., 2008) and decreased job performance (Nahrgang et al., 2011).

In the education field, research on academic burnout first focused on students in tertiary education (Schaufeli, Martínez, et al., 2002). Subsequent research investigated burnout in adolescents attending secondary school (Salmela-Aro, Kiuru, et al., 2009). Students of all ages belong to academic organizations that assign them tasks such as tests, classes, and homework, and these activities can expose them to chronic stress (Salmela-Aro, Kiuru, Pietikäinen, et al., 2008). Such exposure to chronic stressors can lead to burnout.

Like professional burnout, school burnout (SBO) is generally defined as a combination of three dimensions: emotional exhaustion, cynicism, and a feeling of inadequacy (Schaufeli, Salanova, et al., 2002). Exhaustion describes a feeling of strain and chronic fatigue. Cynicism involves a loss of interest in one's work, an indifferent or distant attitude toward schoolwork, or not seeing schoolwork as meaningful. Finally, a feeling of inadequacy refers to reduced feelings of competence, achievement, and accomplishment. This is concerning since adolescence is a period of vulnerability, especially to stress; indeed, exposure to stress can lead to psychopathology problems (Roberts & Lopez-Duran, 2019; Romeo, 2013; Sisk & Gee, 2022). Prior research has found that SBO is associated with lower academic achievement and higher psychopathology symptoms (Madigan & Curran, 2020; Salmela-Aro, 2017).

In the work context, some studies have shown that burnout levels match the stability and changes in the work environment: when the environment is stable, so is burnout (Dunford et al., 2012). This relative stability in burnout can result from the stability of work environments (Leana & Barry, 2000). However, a changing workload can also increase burnout levels (Schaufeli et al., 2011). As the secondary education environment is quite stable, SBO can be expected to be relatively stable as well. However, study demands increase with school level, as does school-related stress (Amai & Hojo, 2021; Dumont, 2000). This should be reflected in elevated SBO levels over time. Indeed, some studies suggest that SBO increases during the secondary course (Salmela-Aro, Kiuru, & Nurmi, 2008; Wang et al., 2015). Nevertheless, others suggest that SBO is rather stable (Duineveld et al., 2017). No systematic review or meta-analysis has ever studied SBO development in secondary education in order to reconcile these results.

Another developmental issue that should be investigated in relation to SBO is the understanding of how this syndrome develops over time. Do the different burnout dimensions develop simultaneously, or does one dimension predict another? This temporal development is important for the conceptualization of SBO. In the work context, a consensus has emerged that considers exhaustion as the key factor of burnout and the first to emerge (R. T. Lee & Ashforth, 1993; Leiter, 1989; Taris et al., 2005). In Lee and Ashforth's and Leiter and Taris's models, depersonalization (labeled "cynicism" in SBO) and sense of inadequacy emerge as responses to exhaustion due to high demands. Some studies suggest that depersonalization leads to inadequacy: the individual becomes cynical in an attempt to protect themselves from energy loss, but the process of exhaustion continues, and the absence of commitment due to depersonalization leads to a diminution of personal accomplishment (Leiter, 1989; Leiter & Maslach, 1988). However, some results show different patterns concerning the links between depersonalization and inadequacy. Taris et al. (2005) showed that exhaustion predicted depersonalization, which, in turn, predicted inadequacy and exhaustion. In the educational field, it is important to determine whether exhaustion is also the key dimension and the first to develop, and also to identify the causal relations that exist between exhaustion and the two other dimensions: cynicism and inadequacy.

Many variables are statistically associated with SBO and may be either predictors or outcomes. Predictors are likely to be stable individual characteristics like gender, socioeconomic status (SES; Luo et al., 2016; Salmela-Aro, Kiuru, Pietikäinen, et al., 2008; Virtanen et al., 2018), personality traits (Luo, Wang, Zhang, Chen, et al., 2016; Slivar, 2001), or organizational characteristics (Lebert-Charron et al., 2019). Some predictors are controversial. For example, some studies have shown that girls are more likely to suffer from SBO (Herrmann et al., 2019; Winga et al., 2016), but this result is not always supported (Cadime et al., 2016; Oller-Perret & Walburg, 2018; Yeni PalaBiyik, 2014).

SBO outcomes may include educational outcomes and mental health issues. In particular, SBO is associated with lower academic achievement (Lee et al., 2010; Salmela-Aro et al., 2008), reduced educational aspirations (Korhonen et al., 2016), lower graduation rates, and more dropouts (Bask & Salmela-Aro, 2013). It is also associated with degraded health and well-being indicators, including depression symptoms (Fiorilli et al., 2017; Gerber et al., 2015; Salmela-Aro, Savolainen, et al., 2009; Walburg et al., 2014; Wang et al., 2015), anxiety symptoms (Lee et al., 2020), and reduced life satisfaction or subjective well-being (e.g. Aypay, 2011; Çapri et al., 2013; Mehdinezhad, 2011; Özhan & Yüksel, 2021).

Transversal designs do not allow any inferences about causal relationships. For example, perceived social support is known to buffer the effects of stress on mental health (Taylor, 2011). While social support should therefore be a negative predictor of SBO, one could argue that the development of SBO, which includes cynicism, may degrade a person's perception of such support. In this case, SBO would predict lower perceived social support.

Considering the aforementioned challenges, this review has two main objectives. The first is to synthesize knowledge about the stability and trajectories of SBO in secondary students. In particular, we aim to verify whether SBO changes or remains stable over time, assess the existence of different trajectories of stability or change, and establish longitudinal links between the dimensions of SBO. The second objective is to synthesize knowledge about the predictors and consequences of SBO among secondary students that have been assessed in studies using longitudinal designs.

## Methods

This systematic review adheres to the method outlined by the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines (Moher et al., 2009; Page et al., 2021). The protocol was registered with PROSPERO (number CRD42021242652).

### Search Procedure

The literature search was performed in the Educational Resources Information Center (ERIC), PsycINFO, PubMed, and PubPsych databases on March 15, 2021. The keywords were identified after an initial scoping review of the literature, and a behavioral and social sciences librarian was consulted to design the search strategy. The keywords were combined with Boolean operators and used with truncations. We included studies published from January 2002, the year of publication of the first scale measuring student burnout (the MBI-SS; Schaufeli et al., 2002) to February 2021. The search used in each database were ("academic burnout" OR "school-related stress" OR "learning burnout" OR "school burnout") OR ("burnout" OR "burn-out" OR "burn out") AND ("middle school student\*" or "high school student\*" or "secondary school student\*" or "secondary education student\*" or "junior high student\*" OR "adolescen\*"). We applied this query to the titles and abstracts in PubMed and PsycINFO and the full text in ERIC and PubPsych. When possible, the database thesaurus was also used to complete the query. In order to identify unpublished results, Google Scholar was queried manually for extra sources, and we consulted the bibliographies of the selected publications.

## Inclusion and Exclusion Criteria

Only studies assessing SBO and employing longitudinal follow-ups were included. No constraints were made regarding the design, the number of waves of assessment, or the follow-up interval of the studies. As the research on school burnout is quite recent, there is no consensus on these issues. Only studies with quantitative approaches were included, regardless of the assessment tool and its dimensional approach. We included studies reporting the effects of interventions targeting SBO if they also provided information on SBO's evolution in a control group with no intervention. No restriction was implemented regarding the language of publication, but only publications in English or French were included in the final selection (as these are the only languages sufficiently mastered by this study's authors). The articles set aside due to language are reported in the flow chart. All publication types, peer-reviewed or not, were included to limit publication bias.

## Record Screening

Record screening was completed with Microsoft Excel. The studies' titles and abstracts were independently screened and assessed by two investigators (AV and JL) to identify relevant studies. When in doubt, each author checked the methods section of the full-text article. Of the initial 1,119 records, disagreement remained for 100 (inter-rater reliability: 91.07%). Next, the authors discussed the records where disagreement was noted, using the full text when necessary. When disagreement remained, the records were submitted to a third party (EC) who made the final decision.

## Data Extraction

The study characteristics and results were extracted by the main author (AV) and checked by the co-authors (JL and EB). Omissions or discrepancies were resolved by consensus or, when necessary, appeal to a fourth party (EC).

The study characteristics (first author, year, country, level of education and track, name of the cohort when available, number of students in each wave, proportion of girls, age at baseline, age range, number of waves and interval, and SBO instrument used) were extracted. Then, the results related to the evolution of SBO were extracted when provided (global trend, causal links between dimensions, and trajectory analysis), as well as the statistical methods that were used to assess them.

Finally, the variables linked to SBO in each article were extracted and described as either negatively predicting SBO, positively predicting SBO, being positively predicted by SBO, or being negatively predicted by SBO. The statistical methods that the researchers used to assess their results were also recorded.

## Risk of Bias

The risk of bias was assessed by the main author (AV) and checked by the co-authors (JL and EB) using the CASP Cohort Study Checklist (Singh, 2013). Only the first nine items, corresponding to two domains of evaluation (the description of results and their validity), were used to assess quality. The studies' limitations mostly concerned the failure to identify and mitigate confounding factors (age, gender, socioeconomic status, and grade point average) in their design and analyses, as well as a lack of information about cohort recruitment (e.g., parental advisory). In another attempt to reduce the risk of bias, all non-significant associations concerning the predictors and outcomes of SBO were reported.

## Results

### Study Selection

We identified 43 articles representing 48 studies (Figure 1). Table 1 shows the studies' countries, school levels, cohort names, sample sizes, follow-up, percentage of girls, age at baseline, age range, and assessment tools.

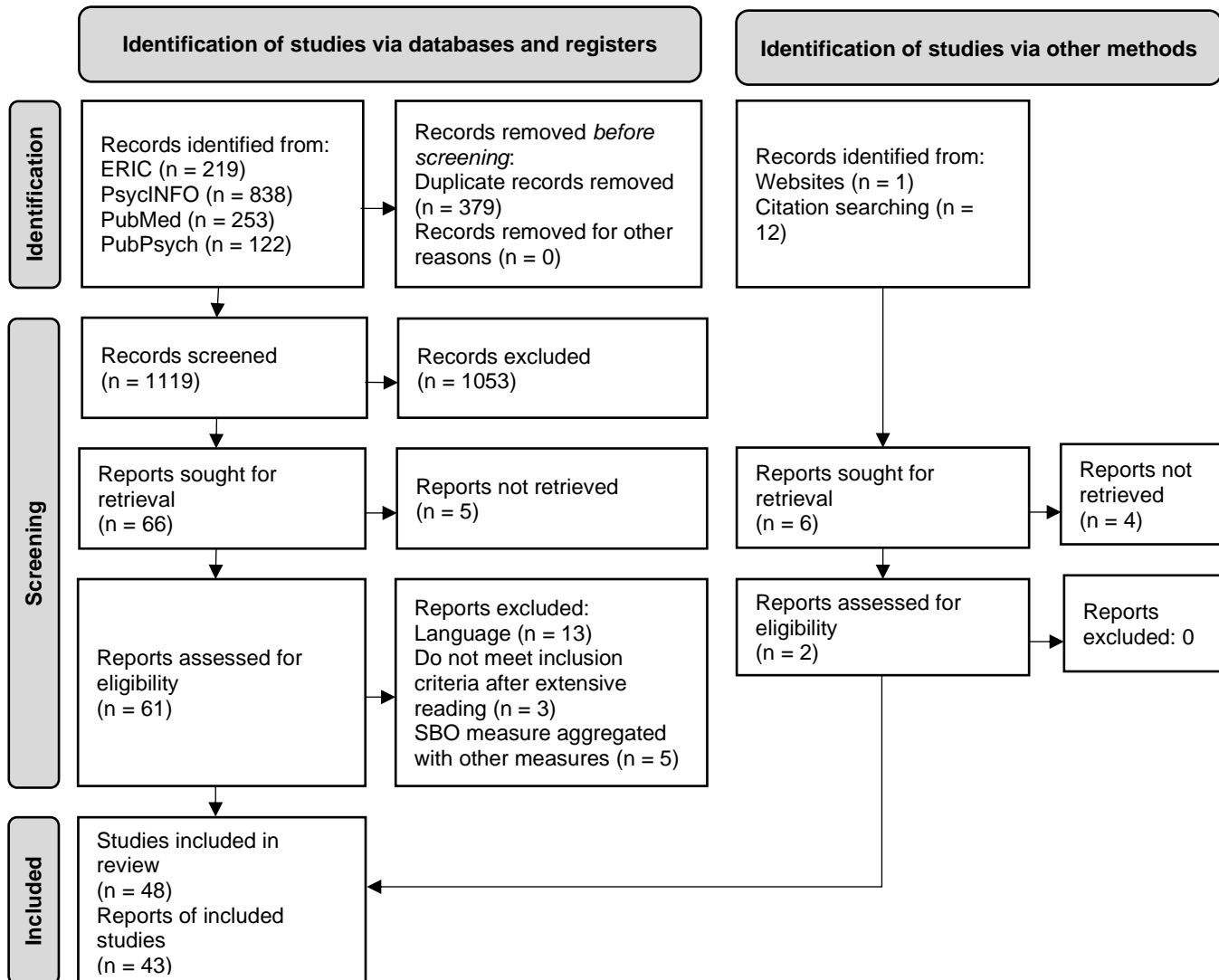
A total of 30 studies (60%) were conducted in Finland, nine in South Korea, two in China, two in Estonia, two in Lithuania, one in Taiwan, one in Italy, and one in the USA (Table 2). Katariina Salmela-Aro contributed to 34 of the selected articles, including 17 on Finnish data. Several studies were performed with the same cohorts; the FinEdu Cohort (Finland) was used in 15 studies and four other cohorts were used in two studies each (Table 1).

Concerning the studies' evaluation methods, 31 studies assessed SBO with the School Burnout Inventory (Salmela-Aro, Kiuru, et al., 2009); seven used the Maslach Burnout Inventory-Student Survey (Schaufeli, Martínez, et al., 2002); six, the Bergen Burnout Inventory (Salmela-Aro & Näätänen, 2005); two, the Korean Academic Burnout Scale (Y. B. Lee et al., 2009); and two, the Academic Burnout Inventory (Hu & Dai, 2007). All these scales adopt a tridimensional approach to SBO except the Korean Academic Burnout Scale. The latter was adapted in Korea from the Maslach Burnout Inventory-Student Survey and uses five dimensions: exhaustion, cynicism, inefficacy, academic hatred, and academic anxiety.

This selection includes 14 studies that focus on upper secondary students, or high school (three of which include follow-up during tertiary education); 16 studies that focus on lower secondary students, or middle school (four of which begin before lower secondary); and 12 that include lower and upper secondary students. Six studies had longer follow-ups covering more than two education levels. The number of waves ranged from two to five, and follow-ups lasted between three and 72 months. The analyzed samples ranged from 17 to 5,286 (mean = 815).



Figure 1 - Flow Chart



**Table 1**

*Characteristics of 48 studies reported in 43 articles that were used in the systematic review*

Study	Location	Education*												Cohort Name	Participants in each wave	Total sample (subset used for analysis)	Follow-up (number of waves, interval)	% of girls in the final sample	Mean age at baseline	Age range of the follow-up	Assessment tool (Subset of dimensions when scale is partially used)
		10	11	12	13	14	15	16	17	18	19	20									
Aunola et al. (2018)	Finland							x						Finnish Dual Career	391/368	391 (368)	2 waves, 6 months	na	16	[16–17]	SBI
Bask & Salmela-Aro (2013)	Finland						x	x	x				x	FinEdu	na	878 (633)	4 waves, 1 year and 3 years	na	16	[16–21]	SBI
Choi et al. (2020)	South Korea											x			950/921/900	921 (900)	3 waves, 2 months	na	18	18	KABI
Duineveld et al. (2017) Study 1	Finland			x	x									MtG	760/483	760 (760)	2 waves, 1 year	55.8%	12	[12–13]	SBI (3 items of Exhaustion)
Duineveld et al. (2017) Study 2	Finland						x	x						FinEdu	214/189	214 (214)	2 waves, 1 year	55.9%	16	[16–17]	SBI (3 items of Exhaustion)
Duineveld et al. (2017) Study 3	Finland											x		FinEdu	858/607	858 (858)	2 waves, 3 years	52,6%	18	[18–21]	SBI (3 items of Exhaustion)
Engels et al. (2019)	Finland			x	x		x							First Steps	na	na (356)	3 waves, 1 year and 2 years	42.7%	12	[12–16]	BBI-15 (4 items of Exhaustion)

Erentait et al. (2018)	Lithuania				x	x	x						Positive Youth Development	916/873/784	916 (916)	3 waves, 1 year	51.4%	15	[14–17]	SBI
Evers et al. (2020)	Taiwan			x	x									2,462/2,283	2,462 (2,283)	2 waves, 6 months	47.5%	13	[13–14]	SBI
Kim et al. (2015)	South Korea		x	x										412/404/379/400	412 (327)	4 waves, 6 months	56.0%	13	[13–14]	MBI-SS
Kim et al. (2017)	South Korea		x	x										405/375/388	412 (405)	3 waves, 6 months	56.5%	12	[12–13]	MBI-SS
Kiuru et al. (2008)	Finland					x							KST	611/614	773 (517)	2 waves, 5 months	51.2%	15	15	BBI-10
Lee & Lee (2018)	South Korea		x	x										na	na (415)	4 waves, 6 months	55.2%	na	na	MBI-SS
Lee et al. (2020)	South Korea								x	x				653/653/238	653 (na)	3 waves, 4 months and 3 months	56.0%	na	na	KABI (Exhaustion, Cynism, Academic Hatred)
Lessard (2019)	USA	x	x	x	x									5,991/4,733/3,578/3,816	5,991 (na)	4 waves, 1 year and 2 years	na	na	na	SBI
Lindfors et al. (2018)	Finland			x	x									9,079/5,742/5,583	9,079 (4,467)	2 waves, 2 years	na	12	[12–16]	SBI
Marion (2011)	Finland					x	x						FinEdu	1,494/1,177	1,494 (1,177)	2 waves, 1 year	58.7%	17	na	BBI-10
Marion et al. (2014)	Finland					x	x						FinEdu	1,494/1,177	1,494 (320)	2 waves, 1 year	na	16	[16–17]	BBI-10
Noh et al. (2013)	South Korea		x	x										367/382/375	405 (358)	3 waves, 6 months	56.6%	13	[13–14]	MBI-SS
Noh et al. (2016)	South Korea				x									391/388	391 (388)	2 waves, 4 months	55.9%	15	15	MBI-SS
Noh et al. (2019)	South Korea				x									38/38	38 (17)	2 waves, na	00.0%	16	16	MBI-SS
Parker & Salmela-Aro (2011)	Finland					x	x	x						na/642/818/na	552 (na)	4 waves, 9 months	52.0%	16	[16–19]	BBI-10



Salmela-Aro et al., (2009) Study 1	Finland					x	x					FinEdu	611/614/725	725 (658)	3 waves, 4 months and 8 months	47.9%	15	[15–16]	SBI
Salmela-Aro et al., (2009) Study 2	Finland					x	x	x				Staying in Track	474/412/414	474 (474)	3 waves, 1 year	na	16	[16–18]	SBI
Salmela-Aro, Upadyaya et al. (2017) Study 1	Finland		x	x								Mind-the-Gap Survey Millennium	760/1,403	1,403 (461)	2 waves, 1 year	53.2%	12	[12–14]	SBI
Salmela-Aro, Upadyaya et al. (2017) Study 2	Finland						x	x				Mind-the-Gap Survey High School	1,261/902	1,636 (580)	2 waves, 1 year	64.0%	16	[16–18]	SBI
Seong et al. (2021)	South Korea		x	x	x	x	x						na	450 (336)	3 waves, 3 months	63.4%	15	[13–18]	MBI-SS
Sorkkila et al. (2018)	Finland						x					Finnish Dual Career	391/373	391 (373)	2 waves, 6 months	52.0%	16	16	SBI
Tuominen et al. (2020)	Finland		x	x									705/419	705 (419)	2 waves, 1 year	56.3%	12	[12–13]	SBI
Tuominen-Soini et al. (2012)	Finland					x	x					FinEdu	707/579	707 (579)	2 waves, 1 year	49.7%	15	[15–16]	SBI
Vasalampi et al. (2009)	Finland				x	x	x					FinEdu	614/636/449	763 (na)	3 waves, 1 year	na	17	[17–19]	SBI
Vinter at al. (2021)	Estonia				x							Supporting teachers...	na	224 (148)	3 waves, 3 months and 4 months	48.0%	14	14	SBI
Vinter et al. (2020)	Estonia				x							Supporting teachers...	na	362 (326)	2 waves, 3 months	51.0%	14	14	SBI (Exhaustion & Cynism)
Vuori et al. (2008)	Finland					x	x						1,034/903	1,034 (na)	2 waves, 1 year	50.3%	14	[14–15]	SBI
Wang et al. (2018)	Finland						x	x				FinEdu	1,172/1,022	1,172 (1,022)	2 waves, 1 year	na	16	[16–17]	BBi-10
Wang et al. (2015)	Finland					x	x	x				FinEdu	na	na (362)	3 waves, 1 year	52.2%	15	[15–17]	SBI
Ying et al. (2016)	China		x	x	x	x	x	x	x	x			788/575/329/243	788 (329)	4 waves, 6 months	54.8%	15	[12-19]	ABI

Zhou et al.  
(2019)

China



638/611/  
320/230

638 (391)

4 waves,

6 months 57.8%

15

[15–17]

ABI

*\*In the Education column: numbered columns represent students' mean age, and crosses represent the education level of the students included in the study: light gray represents primary education, medium gray represents lower secondary education, dark gray represents upper secondary education and white represents tertiary education or work.*

## Stability and Change in School Burnout Trajectories

### Absolute Stability or Change in SBO over Time

Twenty-seven publications provided information on the absolute stability of SBO (mean-level stability or change) through 32 studies (Table 2). One was conducted in Estonia (Vinter et al., 2020), 23 in Finland (see references in Table 2), one in Italy (Romano et al., 2021), one in Lithuania (Raiziene et al., 2014), five in South Korea (Kim et al., 2015, 2017; M. Y. Lee et al., 2020; M. Y. Lee & Lee, 2018; Noh et al., 2019), and one in Taiwan (Evers et al., 2020). Given the broad diversity of statistical approaches used in the studies, the labels “stability” or “change” were determined based on how the authors interpreted their results in their results and discussion sections.

**Table 2***Overall stability and change in SBO levels in 16 studies*

Study	Location	Education*										Global trend	Length of the total follow-up (months)
		10	11	12	13	14	15	16	17	18	19		
Aunola et al. (2018)	Finland							x				Increase	6
Bask & Salmela-Aro (2013)	Finland						x	x	x		x	Increase (especially for cynicism)	72
Duineveld et al. (2017) Cohort 1	Finland			x	x							Increase	12
Duineveld et al. (2017) Cohort 2	Finland						x	x				Stability	12
Duineveld et al. (2017) Cohort 3	Finland								x		x	Stability	36
Engels et al. (2019)	Finland			x	x		x					Increase	48
Evers et al. (2020)	Taiwan				x	x						Stability	6
Kim et al. (2015)	South Korea			x	x							Increase	24
Kim et al. (2017)	South Korea			x	x							Increase	18
Lee & Lee (2018)	South Korea			x	x							Increase	24
Lee et al. (2020)	South Korea								x	x		Stability	7
Marion (2011)	Finland							x	x			Increase	12
Marion et al. (2014)	Finland							x	x			Increase	12
Noh et al. (2019)	South Korea					x						Stability	na
Parker & Salmela-Aro (2011)	Finland						x	x	x			Stability	30
Parviainen et al. (2020)	Finland			x	x		x	x				Increase in exhaustion. Stability in cynicism.	48
Raiziene et al. (2014)	Lithuania							x	x			Stability	12
Romano et al. (2021)	Italy					x	x	x	x			Increase	8
Salmela-Aro & Tynkkynen (2012)	Finland						x	x	x			Stable among students in the vocational track, increase in the academic track. Decrease in	30





A total of 16 studies reported stable levels of SBO. One reported stability among vocational students but observed an increase among students in an academic track. The other 16 studies reported an increase in SBO; one of these studies reported an increase among high school students in the academic track and a decrease among students in the vocational track.

In an attempt to clarify these mixed results, we examined the results more precisely by categorizing the studies by school level. Among the studies examining the transition from primary to lower secondary education, one observed stability and two reported an increase in SBO. Among studies of only lower secondary students, two observed stability, and five reported an increase. On the transition from lower to upper secondary education, four studies found stability and four an increase. Among studies of high school students only, four reported stability and four an increase. Three studies of the transition from high school to adulthood found stability. Finally, three studies included longer intervals. Two of these followed adolescents from lower secondary to adulthood; one found stability and one an increase. The other followed children from primary education to high school and also found an increase in SBO.

#### Distinct Trajectories of SBO

Four studies used growth mixture modeling to assess SBO trajectories (Table 3). One was conducted in China, two in Finland, and one in South Korea. Each study identified between two and four trajectories.

**Table 3***Trajectory analyses in four studies*

<b>Study</b>	<b>Country</b>	<b>Education level</b>	<b>Statistical method</b>	<b>Trajectories found</b>
Lee & Lee (2018)	South Korea	Lower secondary	Growth mixture modeling	1 - Moderate-maintain (51,33%) 2 - Well-adjusted (38,07%) 3 - Low-deteriorating (3,61%) <i>(all increasing in time)</i>
Salmela-Aro & Upadyaya (2014) Developmental... Study 1	Finland	Lower secondary Upper secondary Tertiary education	Growth mixture modeling	1 - Low-stable (60%) 2 - High-decreasing (8%) 3 - Low-increasing (29%) 4 - Low strongly increasing (3%)
Salmela-Aro & Upadyaya (2014) Developmental... Study 2	Finland	Upper secondary	Growth mixture modeling	1 - Moderate slightly decreasing (94%) 2 - High increasing (6%)
Zhou et al. (2019)	China	Lower secondary	Growth mixture modeling	1 - Increasing (3.9%) 2 - Decreasing (10.7%) 3 - Low (85.4%)

Notably, in the four studies, most students display favorable trajectories (stable or very slightly increasing trajectories of moderate or low SBO). Stable trajectories represent 60% to 85.4% of the samples. These trajectories affect students with low or moderate levels of SBO. Unfavorable trajectories (i.e., increasing or dramatically increasing trajectories) were found in all studies and represented 3.9% to 32% of the analyzed samples. These trajectories are shown within both low-SBO and high-SBO samples. Three studies identified trajectories with decreasing SBO levels. Zhou et al. (2019) found that 10.7% of their sample of lower secondary students showed a pattern of decreasing burnout. Meanwhile, Salmela-Aro and Upadyaya (2014) found that 8% of adolescents from lower to upper secondary had decreasing SBO, while 94% of upper secondary students showed slightly decreasing, moderate levels of SBO.

#### Longitudinal Links Between the Three SBO Dimensions

Eight studies analyzed the links between the different dimensions of SBO (see Table 4). Three used data collected in South Korea, and five were conducted in Finland.

**Table 4**

#### *Links between dimensions of BOS in 8 studies*

<b>Study</b>	<b>Assessment tool</b>	<b>Country</b>	<b>Links between dimensions</b>
Lee et al. (2020)	KABI*	South Korea	Exhaustion predicts cynicism Exhaustion predicts academic hatred Academic hatred (T1) positively predicts cynicism (T2) Cynicism (T2) positively predicts academic hatred (T3)
Kim et al. (2015)	MBI-SS	South Korea	Exhaustion positively predicts cynicism Exhaustion positively predicts inadequacy High cynicism negatively predicts inadequacy High cynicism negatively predicts exhaustion
Noh et al. (2013)	MBI-SS	South Korea	Exhaustion positively predicts cynicism Inadequacy positively predicts cynicism
Parker & Salmela-Aro (2011)	BBI-10	Finland	Exhaustion positively predicts inadequacy Cynicism positively predicts inadequacy
Salmela-Aro, Upadyaya et al. (2017) Study 1	SBI	Finland	Cynicism and inadequacy positively predict each other over time
Salmela-Aro, Upadyaya et al. (2017) Study 2	SBI	Finland	Inadequacy positively predicts exhaustion Cynicism and inadequacy positively predict each other over time
Salmela-Aro & Upadyaya (2017)	SBI	Finland	Exhaustion positively predicts cynicism Exhaustion positively predicts inadequacy
Salmela-Aro & Tynkkynen (2012)	SBI	Finland	Exhaustion positively predicts cynicism Exhaustion positively predicts inadequacy

In five out of eight studies, exhaustion predicted cynicism (Kim et al., 2015; M. Lee et al., 2020; Noh et al., 2013; Salmela-Aro & Tynkkynen, 2012; Salmela-Aro & Upadyaya, 2017); no study showed the reverse. In four out of seven studies that used inadequacy as a dimension, exhaustion predicted inadequacy (Kim et al., 2015; Parker & Salmela-Aro, 2011; Salmela-Aro & Tynkkynen, 2012; Salmela-Aro & Upadyaya, 2017). One study showed the reverse (Salmela-Aro, Upadyaya, et al., 2017, study 1).

The links between inadequacy and cynicism are less clear. One study showed that inadequacy predicts cynicism (Noh et al., 2013) and one the reverse (Parker & Salmela-Aro, 2011). Moreover, two studies showed a bi-directional link (Salmela-Aro, Upadyaya, et al., 2017). In one study (Kim et al., 2015), a high level of cynicism predicted less change in exhaustion and inadequacy.

Lee et al. (2020) used three of the five dimensions of the KABI (Y. B. Lee et al., 2009)—academic hatred, cynicism, and exhaustion—and found that academic hatred at T1 predicted cynicism at T2, which in turn predicted academic hatred at T3. Additionally, exhaustion at T1 predicted academic hatred and cynicism at T2, and exhaustion at T2 predicted academic hatred and cynicism at T3.

#### Predictors and outcomes of School Burnout

Forty-two studies conducted analyses to identify variables associated with SBO. Twenty-one controlled for baseline variable levels in their statistical analyses, enabling inferences about the probable causes and consequences of SBO. Their results, as well as the results of studies including time-invariant variables, are reported in Table 5.

**Table 5***Variables associated with SBO in 42 studies: distinctions between predictors and outcomes*

<b>Study</b>	<b>Statistical technique(s)</b>	<b>Control for baseline levels</b>	<b>Probable predictors</b>	<b>Probable outcomes</b>	<b>Other significant relationships</b>	<b>Non-significant relationships</b>
<b>Aunola et al. (2018)</b>	Latent growth modeling				Time spent in sports, Maternal affection, Mother's psychological control, Academic performance	Paternal affection, Father's psychological control
<b>Bask &amp; Salmela-Aro (2013)</b>	Latent growth curves, multiple group analysis, binary logistic regression analysis				Academic track, Dropout	Vocational track
<b>Choi et al. (2020)</b>	Correlations, structural equation modeling				Type of motivation, Perfectionism	
<b>Duineveld et al. (2017) Study 1</b>	Cross-lagged analysis	X				Parental autonomy support
<b>Duineveld et al. (2017) Study 2</b>	Cross-lagged analysis	X				Parental autonomy support
<b>Duineveld et al. (2017) Study 2</b>	Cross-lagged analysis	X	Parental autonomy support			
<b>Engels et al. (2019)</b>	Cross-lagged analysis	X		Behavioral engagement, Cognitive engagement		Gender, Academic performance, Teacher–student conflicts

<b>Erentait et al. (2018)</b>	Cross-lagged analysis	X		Behavioral engagement, Identity style		
<b>Evers et al. (2020)</b>	Cross-lagged analysis	X	Academic performance		Disturbed Sleep	
<b>Kim et al. (2017)</b>	Latent growth modeling		Effort–reward imbalance		Problem-focused coping	Emotion-focused coping
<b>Kiuru et al. (2008)</b>	Multilevel latent growth modeling	X	Feminine peer group, Peer group SBO level, Peer group achievement		Academic performance	Gender, Peer group selection
<b>Lee &amp; Lee (2018)</b>	Growth mixture modeling	X	Compulsive symptoms, Depressive symptoms			
<b>Lessard (2019)</b>	Structural equation modeling		Gender, Level of parental education, Maintenance of friendships across transition			
<b>Lindfors et al. (2018)</b>	Multilevel linear modeling				Parental monitoring of children's activities, Quality of teacher–student relationships	
<b>Noh et al. (2016)</b>	Structural equation modeling				Religious coping	
<b>Noh et al. (2019)</b>	General linear modeling with repeated measures	X				Salivary cortisol
<b>Parviainen et al. (2020)</b>	Latent growth analyses		Gender		Arithmetic skills, Reading skills, Self-esteem, Internalized symptoms	

<b>Raiziene et al. (2014)</b>	Cross-lagged structural equation model	X		Satisfaction with life	
<b>Romano et al. (2021)</b>	Stepwise hierarchical multiple regressions			Teacher's sensitivity	Teacher's positive climate, Teacher's regard for adolescent perspective
<b>Salmela-Aro et al. (2008)</b>	Latent growth modeling		Gender, Vocational, and Academic track	Academic performance	
<b>Salmela-Aro, Read et al. (2017)</b>	Multilevel modeling		Immigrant status		
<b>Salmela-Aro, Savolainen, Holopainen (2009) Study 1</b>	Cross-lagged analysis	X		Depressive symptoms	
<b>Salmela-Aro, Savolainen, Holopainen (2009) Study 2</b>	Cross-lagged analysis	X		Depressive symptoms	
<b>Salmela-Aro &amp; Tynkkynen (2012)</b>	Linear growth curve model		Academic track		Vocational track
<b>Salmela-Aro &amp; Upadyaya (2014) Developmental... Study 1</b>	Growth mixture modeling		Gender		
<b>Salmela-Aro &amp; Upadyaya (2014) Developmental... Study 2</b>					Gender



<b>Salmela-Aro &amp; Upadyaya (2014)</b> School burnout...	Path analyses				Schoolwork engagement, Satisfaction with life, Depressive symptoms	
<b>Salmela-Aro &amp; Upadyaya (2017)</b>	Path and cross-lagged analysis		Gender, Family SES status		Educational aspirations, Educational attainment, Perceived stress	
<b>Salmela-Aro, Upadyaya et al. (2017) Study 1</b>	Autoregressive cross-lagged path models	X		Excessive internet use		Gender, Family SES status, Schoolwork engagement, Depressive symptoms
<b>Salmela-Aro, Upadyaya et al. (2017) Study 2</b>	Autoregressive cross-lagged path models	X	Gender, Excessive internet use, Family SES status, Depressive symptoms	Excessive internet use, Schoolwork engagement, Depressive symptoms		
<b>Seong et al. (2021)</b>	Cross-lagged path analyses	X	Perfectionism			
<b>Sorkkila et al. (2018)</b>	Cross-lagged analysis	X		Sport burnout	Achievement orientation goals	Dropout
<b>Tuominen et al. (2020)</b>	Latent transition analyses, ANCOVA	X	Achievement orientation goals			
<b>Tuominen-Soini et al. (2012)</b>	Latent profile analyses, configural frequency analyses, ANCOVA	X	Achievement orientation goals			
<b>Vasalampi et al. (2009)</b>	Structural equation modeling				Educational attainment, Educational	

						aspirations, Progress in achieving goals	
<b>Vinter (2020)</b>	<b>et al.</b>	Multigroup structural equation modeling, ANOVA		Gender		Refocus on planning, Rumination	
<b>Vinter (2021)</b>	<b>at al.</b>	Latent profile analyses and ANOVA				Positive reappraisal, Catastrophizing, Self-blame, Rumination, Academic buoyancy	Acceptance, Positive refocusing, Putting into perspective, Refocus on planning, Blaming others
<b>Vuori (2008)</b>	<b>et al.</b>	Multivariate latent growth curve modeling		Gender		Learning difficulties, Academic performance	
<b>Wang (2015)</b>	<b>et al.</b>	Multivariate latent growth curve modeling	X	Gender		Depressive symptoms	Academic performance
<b>Wang (2018)</b>	<b>et al.</b>	Multivariate longitudinal SIENA models	X	Peer group BOS level	Peer group selection		
<b>Ying et al. (2016)</b>		Hierarchical regression analyses	X	Resilience			
<b>Zhou (2019)</b>	<b>et al.</b>	Latent growth mixture modeling				PTSD symptoms	

### Time-invariant variables

Twelve studies investigated the link between gender and SBO. Three of them found no significant link (Engels et al., 2019; Kiuru, 2008; Salmela-Aro et al., 2017, study 1), while nine found a positive association between female gender and SBO (Lessard, 2019; Parviainen et al., 2020; Salmela-Aro, Kiuru, & Nurmi, 2008; Salmela-Aro, Upadyaya, et al., 2017; Salmela-Aro & Upadyaya, 2014, 2017; Vinter et al., 2020; Vuori et al., 2008; Wang et al., 2015). Of these nine studies, two found that female gender was associated with exhaustion only (Parviainen et al., 2020; Salmela-Aro & Upadyaya, 2017). One found that male gender was associated with increased cynicism (Salmela-Aro & Upadyaya, 2017).

Concerning socioeconomic and cultural background, one study found that the level of parental education was positively related to SBO (Lessard, 2019); students with more educated parents displayed higher levels of SBO. Three studies provided information on SES expressed as a parental job category. One found no significant link (Salmela-Aro et al., 2017, study 1), another found a negative link between SES and SBO level (Salmela-Aro et al., 2017, study 2), and the third found a positive link between SES and the inadequacy dimension of SBO (Salmela-Aro & Upadyaya, 2017). Another study found a positive relationship between immigrant status and SBO (Salmela-Aro, Read, et al., 2017).

### Personality Factors

Seong et al. (2021) found that general perfectionism positively predicted SBO. Academic buoyancy, which reflects students' ability to handle academic setbacks in everyday life and is very similar to the trait-resilience construct, was found to protect against the development of SBO (Ying et al., 2016).

### Identity Style

Erentaité et al. (2018) found that SBO increased the likelihood of developing two identity styles: normative (reliance on significant others' prescriptions for setting goals and values) and diffuse-avoidant (avoidance of identity issues). No association was found with an information-oriented style (engagement in identity exploration).

### Out-of-School Activities

One study found that sports burnout was positively impacted by SBO (Sorkkila et al., 2018): exhaustion at school increased exhaustion in sports. Two studies demonstrated links between excessive internet use and SBO (Salmela-Aro, Upadyaya, et al., 2017, studies 1 & 2). The first showed that exhaustion at school caused more excessive internet use, while the second showed reciprocal links between the two. Finally, one study found that SBO positively predicted disturbed sleep due to social media (Evers et al., 2020).

### Academic Competence and Trajectories

Two studies found no association between vocational track and SBO (Bask & Salmela-Aro, 2013; Salmela-Aro & Tynkkynen, 2012), and one found a decrease in cynicism levels among vocational students (Salmela-Aro, Kiuru, & Nurmi, 2008). All three found that being on an academic track was associated with an increase in SBO levels.

One study showed that grade point average (GPA) impacted SBO, with higher-achieving students displaying lower SBO (Evers et al., 2020).

Some studies investigated the links between SBO and educational trajectories. One study found that SBO was negatively associated with educational attainment (Vasalampi et al., 2009). Another showed that attainment was negatively predicted by cynicism but positively predicted by exhaustion (Salmela-Aro & Upadyaya, 2017). A third found no significant association between SBO and dropout (Sorkkila et al., 2019).

### Relational Variables

Concerning parent–child relationships, one study found that perceived parental support of autonomy protected against exhaustion (Duineveld et al., 2017).

Regarding peer group, one study showed that the maintenance of friendships during the transition between lower and upper secondary school predicted lower SBO (Lessard, 2019). Another showed that belonging to a high-achieving peer group decreased SBO, whereas belonging to a low-achieving peer group increased it (Kiuru, 2008). The same study showed that belonging to a peer group with more girls elevated SBO. Two studies found that peer groups' SBO level influenced individuals' SBO (Kiuru et al., 2008; Wang et al., 2018). The selection effect (students selecting a peer group matching their SBO level) was not significant for the first study (Kiuru, 2008). In the second, it was significant only for a specific profile of students: high-achieving students with high SBO levels tended to select peer groups with similar levels (Wang et al., 2018).

Finally, concerning teacher–student relationships, one study found no significant effect of teacher–student conflicts on SBO (Engels et al., 2019).

### Schoolwork-Related Variables

Some studies focused on achievement orientation goals. In a sample of student-athletes, Sorkkila et al. (2018) showed that performance goals positively predicted cynicism, while mastery goals negatively predicted inadequacy and cynicism. In contrast, Tuominen et al. (2020) found that performance goals only positively predicted exhaustion. Lastly, Tuominen-Soini et al. (2012) showed that exhaustion and cynicism were positively predicted by an achievement orientation goal profile characterized by indifference. Moreover, a profile characterized by avoidance positively predicted cynicism, while a profile characterized by mastery negatively predicted cynicism and inadequacy. Finally, a profile characterized by performance positively predicted exhaustion and negatively predicted cynicism.

Different kinds of engagement were investigated in various studies: behavioral engagement, which refers to students' involvement in academic activities; cognitive engagement, which was conceptualized as the perceived relevance of schoolwork to students' goals; and emotional engagement (or schoolwork engagement), which was defined as a positive, fulfilling, study-related state of mind (Salmela-Aro & Upadaya, 2012). All three forms of engagement were found to be negatively affected by SBO. In particular, SBO negatively predicted behavioral engagement in two studies (Engels et al., 2019; Erentaitė et al., 2018), cognitive engagement in one study (Engels et al., 2019), and emotional engagement in two studies (Salmela-Aro et al., 2017, study 2; Salmela-Aro & Upadyaya, 2014). One study found a non-significant link between SBO and emotional engagement in a sample of primary and lower secondary students (Salmela-Aro et al., 2017, study 1).

### Stress-Related Variables

In one study, SBO was positively predicted by studying demands (Salmela-Aro & Upadyaya, 2017). Another focused on broad categories of coping, reporting that problem-focused coping protected against SBO while emotion-focused coping showed a non-significant association with SBO (Kim et al., 2017). Positive reappraisal was found to negatively predict SBO. Five other strategies showed non-significant relationships with SBO: acceptance, positive refocusing, putting into perspective, refocusing on planning, and blaming others.

### Well-Being, Psychopathology, and Biological Variables

Two studies found that SBO negatively affects life satisfaction (Raiziene et al., 2014; Salmela-Aro & Upadyaya, 2014).

Concerning psychopathology, one study found that compulsive symptoms positively predicted SBO (M. Y. Lee & Lee, 2018). Regarding depression and SBO, one study found no link (Salmela-Aro et al., 2017, study 1) in a sample of young adolescents, while another found reciprocal links in a sample of older adolescents (Salmela-Aro et al., 2017, study 2). Another study found complex results: SBO positively predicted depressive symptoms when SBO signs were at least moderate but not when they were low (M. Y. Lee & Lee, 2018). Four studies found that SBO positively predicted depressive symptoms (Salmela-Aro et al., 2009, studies 1 and 2; Salmela-Aro & Upadyaya, 2014; Wang et al., 2015). Among these studies, two also found a weaker inverse link (Salmela-Aro et al., 2009, studies 1 and 2).

Finally, **one** study examined salivary cortisol levels and found no association with SBO (Noh et al., 2019).

## Discussion

This systematic review of longitudinal studies on SBO had two main objectives. The first was to examine the developmental aspects of SBO among secondary education students (i.e., its evolution over time) including different trajectories and the longitudinal links between its dimensions. Second, we sought to assess the predictors and outcomes of SBO.

### Development of SBO During Secondary Education

There is substantial evidence that SBO levels increase during lower secondary education. This result is congruent with the stage–environment theory (Eccles & Roeser, 2009), which postulates that the school environment may not meet students' psychological needs as they progress through the educational structure. The results concerning upper secondary students are less clear. This may be due to the differential effects of educational tracks, as SBO tends to be lower in vocational tracks (Bask & Salmela-Aro, 2013; Salmela-Aro & Tynkkynen, 2012). Despite this difference, studies did not always mention if their sample included only the academic track or the vocational track as well, which may obscure the results. The academic track may also select for higher-achieving students, who may be more resilient to stress. After upper secondary, SBO levels tend to remain stable in the three study samples included. This could be because students can choose tertiary courses that better meet their needs and resources.

Our review also aimed to determine the existence of distinct SBO trajectories during secondary education. The results affirm diverse SBO trajectories. Most students display favorable trajectories with stable or very slightly increasing SBO levels over time. However, only four studies on SBO trajectories were reviewed, including three countries; this group of studies is too small and too diverse to draw any general conclusion. Nevertheless, all of the studies that provided trajectory analyses highlighted the existence of unfavorable trajectories in 3.9% to 32% of their study samples. Lastly, it is important to emphasize the existence of decreasing SBO trajectories in the small samples of students used in two studies (Salmela-Aro & Upadyaya, 2014; Zhou et al., 2019). The factors involved in these last two types of trajectories must be identified in order to better understand both SBO risk factors and recovery factors.

SBO is considered a process. In the field of professional burnout, cynicism is broadly considered a coping mechanism that aims to disengage from the stressor (R. T. Lee & Ashforth, 1993; Leiter, 1989; Maslach et al., 2001). In contrast, the links between inadequacy and the two other dimensions remain uncertain. Some have found that inadequacy is caused by cynicism because disengagement leads to a lack of efficacy (Leiter, 1989); others report that inadequacy is directly caused by exhaustion, which hinders performance (R. T. Lee & Ashforth, 1993; Leiter, 1989). Taris et al. (2005) suggested that exhaustion may cause inadequacy both directly and via the mediation of cynicism.

The reviewed studies tend to confirm that exhaustion is the first dimension to develop and that it predicts cynicism (Kim et al., 2015; M. Lee et al., 2020; Noh et al., 2013; Salmela-Aro & Tynkkynen, 2012; Salmela-Aro & Upadyaya, 2017) and inadequacy (Kim et al., 2015; Parker & Salmela-Aro, 2011; Salmela-Aro & Tynkkynen, 2012; Salmela-Aro & Upadyaya, 2017). Some studies showed links between cynicism and inadequacy in one direction (Noh et al., 2013; Parker & Salmela-Aro, 2011), while others showed reciprocal links (Salmela-Aro, Upadyaya, et al., 2017). These results indicate that the dimensions may influence each other over time. Feeling inadequate as a student may foster a form of bitterness that may, in turn, develop into cynicism toward studies. Alternatively, as cynicism is a form of detachment from school, it might hinder the student's study efforts, leading them to feel that they do not keep up with schoolwork. It would be interesting to conduct person-centered analyses to reveal individual differences in the development of these two dimensions, as such differences may depend on individual or organizational factors. Notably, one study found that a high level of cynicism has a protective effect against the development of exhaustion and inadequacy (Kim et al., 2015). As cynicism is a process of disengagement, it is likely to alleviate perceived stress. Person-centered analyses have shown that students whose profiles are characterized by high levels of cynicism but low levels of exhaustion and inadequacy may have high self-esteem and well-being (Tuominen-Soini & Salmela-Aro, 2014).

## Predictors of SBO

This review's second main objective was to illuminate and distinguish risk and protective factors on the one hand and issues of SBO on the other. The risk factors will be discussed first, followed by the protective factors. Lastly, we will discuss issues of SBO.

## Risk Factors

The first risk factor identified was gender. A substantial majority of studies found a link between female gender and SBO (Lessard, 2019; Parviainen et al., 2020, 2020; Salmela-Aro, Kiuru, & Nurmi, 2008; Salmela-Aro, Upadyaya, et al., 2017; Salmela-Aro & Upadyaya, 2014, 2017; Vasalampi et al., 2009; Vinter et al., 2020; Vuori et al., 2008; Wang et al., 2015). This result is congruent with the stress literature, which has proposed explanations for girls' higher school-related stress sensitivity. The hypothalamus–pituitary–adrenal (HPA) axis, which is responsible for the biological stress response, develops during puberty. This implies a heightened sensitivity to stressors during adolescence (Bale & Epperson, 2015; Roberts & Lopez-Duran, 2019). This sensitivity may be especially strong for females. Some studies suggest that testosterone inhibits HPA axis responsivity while estradiol has an excitatory effect (Dorn et al., 1996; Green & McCormick, 2016). Another possible explanation is that girls may attach more importance to school achievement while demonstrating poorer academic self-concept. Indeed, girls tend to report more stress related to achievement at school than male adolescents (Amai & Hojo, 2021; Anda et al., 1997; Dumont, 2000; Govaerts & Grégoire, 2004; Murberg & Bru, 2004). Moreover, while displaying higher school performance, girls tend to have lower academic self-concept and lower coping beliefs than boys (Haugan et al., 2021). The lasting imbalance between perceived demand and perceived personal resources could explain why girls experience higher levels of school stress and SBO.

The effect of SES is less clear. One study found a negative link between SES and SBO level (Salmela-Aro et al., 2017, study 2), showing that students from lower-SES families may suffer more from SBO. However, Lessard (2019) reported that higher parental education levels correspond with a higher likelihood that adolescents will suffer from SBO. These results may appear contradictory, but a high education level does not necessarily lead to high SES. In low-SES families, adolescents may have fewer resources to handle school stress, and children of highly educated parents may suffer more parental pressure about school achievement. Finally, one study showed more SBO among immigrant adolescents (Salmela-Aro, Read, et al., 2017). This may be due to the extra work of language and cultural learning or to greater parental pressure in this group, as immigrant families

may have high expectations regarding school achievement to succeed in their immigration journeys.

Among organizational factors, there is substantial evidence that educational tracking affects SBO. An academic track is a risk factor for SBO (Bask & Salmela-Aro, 2013; Salmela-Aro et al., 2008; Salmela-Aro & Tynkkynen, 2012), while a vocational track does not affect it (Bask & Salmela-Aro, 2013; Salmela-Aro & Tynkkynen, 2012) and may even protect against cynicism (Salmela-Aro, Kiuru, & Nurmi, 2008). This is probably due to the greater study demands of academic tracks, as more demanding tracks are associated with higher SBO levels (Meylan et al., 2011). Extracurricular activities may also foster SBO. Among student-athletes, more time spent on sports was related to higher SBO and sports burnout. In addition, excessive internet use can foster SBO (Salmela-Aro, Upadyaya, et al., 2017). The reverse effect was highlighted in the same paper, describing a possible vicious circle. Lastly, belonging to a low-achieving or feminine peer group can increase the individual SBO level (Kiuru, 2008). These two groups likely share lower efficacy beliefs, which may influence individuals through co-rumination (Rose, 2002), vicarious learning, or conforming pressure or desires (Bandura, 1977; Berndt, 1999).

Among psychological characteristics, there is evidence that perfectionism (Seong et al., 2021) and performance-oriented achievement goals (Sorkkila et al., 2018; Tuominen et al., 2020) are risk factors for SBO. Moreover, Tuominen-Soini et al. (2012) showed that indifferent profiles (with no clear achievement goal tendency) and profiles characterized by avoidance achievement goals were at risk.

Lastly, psychopathology can lead to an increase in SBO levels. In PTSD, Internalizing symptoms and compulsive and intrusive symptoms have been shown to foster SBO (M. Y. Lee & Lee, 2018). Students with emotional symptoms may struggle to cope with emotions and present higher distress in stressful situations, increasing SBO. Moreover, compulsive and intrusive PTSD symptoms may exhaust students' cognitive resources, reducing their ability to face academic challenges.

Unfortunately, while many studies investigated the links between GPA and SBO, only one examined cross-lagged associations between the two. This study suggests that higher GPA results in lower SBO (Evers et al., 2020).

### Protective Factors

The reviewed studies highlight some relational protective factors. Parental attitudes—in particular, autonomy-supportive parenting—seem to contribute to protecting adolescents from SBO. The literature suggests that autonomy is a basic psychological need that might be difficult to fulfill in the secondary academic setting (Deci et al., 1991; Eccles et al., 1993). Parental support of this dimension might compensate for the lack of support at school. Relationships with peers might also be important to protect against SBO. In addition, the maintenance of friendships across the transition between school levels (Lessard, 2019) and belonging to a high-achieving peer group have protective effects (Kiuru, 2008). Nevertheless, some cross-sectional studies showed that among the sources of social support, support from teachers might be especially important, as teachers strongly influence school tasks and their attitudes might shape students' perceptions of threats, controllability, and available resources during stressful situations. Unfortunately, no study has investigated this association with a longitudinal cross-lagged design. More research is needed to compare the effects of diverse social support sources on SBO over time.

In the domain of psychological factors, academic buoyancy is, unsurprisingly, a protective factor (Ying et al., 2016). Furthermore, students with mastery achievement goals are less prone to SBO (Sorkkila et al., 2018; Tuominen-Soini et al., 2012).

## Outcomes of SBO

There is clear evidence that SBO harms adolescents' developmental trajectories. Starting with educational outcomes, there is proof that SBO degrades all forms of engagement, including behavioral (Engels et al., 2019; Erentaitė et al., 2018), cognitive (Engels et al., 2019), and emotional engagement (Salmela-Aro, Upadyaya, et al., 2017). This is an important result because it implies that to improve students' well-being, alleviating SBO might be more efficient than focusing on engagement alone. SBO, and cynicism in particular, likely limits educational attainment (Salmela-Aro & Upadyaya, 2017; Vasalampi et al., 2009) and increases the risk of school dropout (Bask & Salmela-Aro, 2013). The absence of significant links in the study by Sorkkila et al. (2018) may be due to the very small sample size. In addition, SBO might negatively affect secondary school students' educational aspirations (Salmela-Aro, Upadyaya, et al., 2017). This effect may reverse when students reach tertiary education and adopt higher educational aspirations (Salmela-Aro, Upadyaya, et al., 2017). More broadly, SBO likely constrains identity development, promoting normative and diffuse-avoidant styles (Erentaitė et al., 2018). Students affected by SBO become less engaged in school tasks and identity formation tasks. These two effects might be caused by the same process of cognitive resource depletion. SBO also negatively affects life satisfaction, reflecting an unfavorable imbalance between positive and negative emotional experiences at school (Raiziene et al., 2014). Moreover, it can affect peer selection: high-achieving students with high SBO levels tend to select peer groups with the same characteristics (Wang et al., 2018). Lastly, SBO may foster excessive internet use, but this link might be reciprocal (Salmela-Aro, Upadyaya, et al., 2017). The effect of SBO on problematic internet use is also supported by Evers et al. (2020), who show that SBO causes disturbed sleep due to social media. Finally, there is strong evidence that SBO is a precursor of depressive symptoms (Salmela-Aro et al., 2009, studies 1 and 2; Salmela-Aro & Upadyaya, 2014; Wang et al., 2015), even if the reverse link also exists (Salmela-Aro et al., 2017). This link may emerge only when the SBO level is moderate or higher (M. Y. Lee & Lee, 2018).

## Implications

These results suggest that SBO is likely to increase in time. Nevertheless, trajectory analyses suggest substantial variability among students and increasing SBO might only affect a minority of secondary students. This review also highlights longitudinal links between SBO dimensions. There is strong evidence that exhaustion is the first dimension to develop and that cynicism and feelings of inadequacy develop subsequently. Overall, these results can support the calibration of effective interventions. It might be beneficial to intervene as soon as lower secondary and to target adolescents in the early stages of the SBO process, in other words, adolescents displaying exhausted-only profiles.

The review of risk and protective factors shows that female adolescents are particularly vulnerable to the SBO process. Girls experience more perceived stress, attach more importance to school achievement, and have lower coping beliefs than boys. The higher risk of SBO among academic tracks is also supported by several studies. Since SBO is likely to increase in the course of secondary education, intervention programs should focus on high school academic tracks.

There is evidence that SBO leads to dysfunctional coping mechanisms (such as the problematic use of internet or social media), or depressive symptoms, that retroactively increase SBO in vicious cycles. When discovered during clinical examination, these behaviors and symptoms should alert clinicians and encourage them to investigate the possibility of an ongoing SBO process.

Finally, the detrimental effects of SBO on students' engagement and educational trajectories should alert policy makers. More research is needed to identify organizational factors that might prevent SBO development.



## Limitations and Future Directions

First, our review may be biased by the overrepresentation of studies conducted in Finland (60% of included studies) using the same cohort (FinEdu). Second, this review included a large variety of designs, and variables of interest, which limited the possibility to draw firm conclusions. Future reviews may investigate possible moderation effects of age, school level, or time between waves. Furthermore, there is a need for replication studies. Third, many studies used global SBO scores, but SBO dimensions are only moderately correlated, and many variables are associated with only one dimension. Future studies should avoid the use of global SBO scores. Fourth, although longitudinal studies allow better distinctions between predictors and outcomes than cross-sectional designs, they have limitations of their own. Fifth, this review included only four studies conducting trajectory analyses, which does not allow for any conclusion on this matter. More research using this type of analysis is needed. Lastly, although SBO is a multidimensional process that cannot be limited to one dimension, some studies used abridged versions of SBO assessment tools, limiting the assessment to one or two dimensions.

## Conclusion

This review is the first to systematically examine longitudinal studies in order to illuminate developmental aspects of SBO and to better distinguish between SBO predictors and outcomes. As such, it offers a major contribution to the field. A better understanding of the SBO developmental process can help in the design of more suitable interventions. The identification of predictors is also crucial for prevention. In this regard, it should be noted that although few organizational factors were identified in this review, they might be particularly relevant for primary and secondary prevention. Therefore, future researchers should consider investigating other organizational factors. Cross-cultural studies might help to emphasize the national education system features that are important in shaping students' work-related subjective experiences, helping to inform policymaking in this area. Furthermore, there is a need for more research on the consequences of SBO and its links with psychopathology. In particular, the links between SBO and anxious symptoms have not been investigated longitudinally, although stress and anxiety share common features that would be beneficial to disentangle.

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