Chapter

Relationship between School Burnout and Social Problem-Solving among Hungarian Students

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Abstract

In Hungary, the relationship between social problem-solving and school burnout has not been studied so far, so our aim was to explore the relationship between these two domains among 13- and 17-year-old Hungarian students (N = 296). Three dimensions of school burnout (emotional exhaustion, cynicism, sense of inadequacy) were analyzed with the School Burnout Inventory, and five factors of social problem-solving (positive and negative problem orientation, rational, impulsive and avoidant problem-solving styles) with the Social Problem-Solving Inventory-Revised. Both questionnaires were performed reliably. Based on the results, 13-year-olds are more likely to have emotional exhaustion and impulsive social problem-solving style, while 17-year-olds are more likely to have negative problem orientation and avoidant problem-solving style. Emotional exhaustion is significantly predicted by avoidant and impulsive problem-solving styles in 17-year-olds. Using latent profile analysis, three profiles (rational optimism, hot-tempered hostility, illogical pessimists) were identified, which—if confirmed in future research—could be used to improve school performance in a more targeted way than is currently the case.

Keywords: school burnout, social problem orientation, social problem-solving, 13- and 17-year-old Hungarian students, latent profile analysis

1. Introduction

In many countries around the world, school burnout (hereinafter referred to as SBO) has been shown to be present at all levels of the education system [1, 2], i.e., it can be present in school-age children, adolescents and university students, making it difficult not only to succeed academically but also socially. Similarly, the results of studies exploring the characteristics and development of social problem-solving (hereinafter referred to as SPS) in different countries [3, 4] are similar: during adolescence, the belief in the success of SPS tends to decrease, SPS style is often impulsive

and the prevalence of avoidant styles gradually increases. However, individual differences in both areas are often large, with several environmental factors (e.g., family background, parenting style, school climate) playing a role in addition to personal characteristics.

Research exploring the relationship between SBO and SPS [5, 6] has found that the relation between these fields is twofold. Burnout leads to peer social problems and inadequate SPS plays a role in the development and persistence of SBO. There is also evidence that effective SPS plays a significant role in reducing the symptoms of SBO. In addition to exploring the direct relationship between SPS and SBO, there is a growing field of research on how they interact through other psychological (e.g., anxiety, attachment) and environmental factors (school climate) and how this can be harnessed in a developmental context [2, 4, 6].

As these relationships have not been investigated in Hungary, the aim of our research was to explore the relationship between SBO and SPS in Hungarian adolescents (13- and 17-year-olds). More and more school development programs are being developed in Hungary, aiming at the combined development of several components of social–emotional competence [4]. The results of this research can significantly contribute to the development of school programs aiming at preventing burnout, effectively addressing burnout problems and reducing the emotional exhaustion and sense of inadequacy caused by ineffective SPS.

2. Theoretical background

Freudenberger [7] originally used the term burnout syndrome to describe a set of symptoms resulting from stress and workload at work. From a physiological point of view, these are the physical consequences of prolonged stress reactions, and from a psychological point of view, they are mainly characterized by three symptoms: emotional exhaustion, depersonalization and reduced performance [8]. Initial studies [7, 9] identified burnout as a problem primarily for healthcare workers and for workers in helping professions, but subsequent studies [10, 11] have shown that symptoms can appear in all stressful environments.

The school provides students with similar tasks, mental challenges and complex social environments as the workplace for adults [12]. The stress resulting from performance expectations and the stress experienced in relationships with peers and authority figures can lead to the development of symptoms of burnout in school. There are many models and empirical studies on the symptoms (measurable dimensions) of SBO, agreeing that burnout has negative effects on both physical and mental health [13]. SBO can be interpreted as a condition caused by exhaustion and tiredness due to the demands at school [14], and as a complex phenomenon of emotional exhaustion, depersonalization and low school performance [15], which is not only due to academic overload but also due to the stress that develops because of psychological problems in the school environment.

Most studies have identified emotional exhaustion due to stress, cynicism (attitudes of general distrust of others' motives) and a sense of inadequacy as the main symptoms of SBO [12, 16]. The instrument we use also measures these dimensions of burnout [16]. Based on an earlier Hungarian cross-sectional study, 16.1% of primary school students can be considered severely affected by SBO, with more cynicism than secondary school students, while there are no significant differences in emotional exhaustion and sense of inadequacy [17].

Symptoms of SBO are associated with several psychological characteristics that are significant for students' success in school. For example, research suggests that SBO symptoms predict school failure and dropout in both cognitive and non-cognitive areas [12], and are associated with lower school performance [17, 18], low academic motivation [19], low self-esteem and self-confidence [20] and ineffective or less effective SPS [5].

The social (interpersonal) problems experienced at school and their solution are fundamental determinants of school well-being, both academic and non-academic success [21]. SPS is a motivational-cognitive-emotional-behavioral process aimed at addressing interpersonal problems [3]. One part of the process is the attitude toward the problem and its solution, which can be essentially negative (lack of confidence in success) or positive (confidence in one's ability to solve the problem), expressing a sense of self-efficacy. The other part of the process of SPS is thinking about the solution, listing alternatives and deciding how to solve it, but this can be accompanied and determined by several unconscious processes. Based on these, the SPS style is usually rational or impulsive or avoidant, or a mixture of these, even in each problem situation [22]. Rational problem solvers keep the facts in mind, are interested in the other's opinion, consider the consequences and communicate assertively. The impulsive problem solvers consider only a few facts closely related to their emotional state and confirm their own beliefs, concentrate mainly on themselves and have difficulty taking on the other person's point of view. Avoidant problem solvers tend to pass the solution on to others or finish it sooner than necessary, they do not want to deal with the problem and often pass the responsibility on to others [23]. Data from both Hungarian and international studies [24, 25] show that negative problem orientation increases gradually during adolescence, as does avoidance style, and impulsivity is high. Rationality shows a significant correlation with cognitive ability, which is highly variable across international studies, as is the change in positive problem orientation during adolescence.

The link between SBO and SPS is twofold. On the one hand, various interpersonal problems and their solutions can lead to burnout, and on the other hand, burnout for other reasons can affect students' interpersonal relationships, worsen relationships through anxiety and stress and lead to disagreements and arguments between students [5, 26]. If a person has a persistent negative problem orientation, burnout can develop, reinforcing a negative problem orientation that is difficult to resolve. Negative school experiences and unsuccessful solutions can result in students becoming distanced from their classmates and classroom activities, feeling lonely and weakening their commitment to school [27]. But negative situations can not only lead to avoidance, they can also create a climate of persistent conflict, which can lead to high impulsivity [4].

According to research among Finnish adolescents, SBO leads to mental fatigue and decreased cognitive resources, which can hinder a student's SPS [28]. Burnout is often associated with a negative problem orientation, meaning students with SBO are more likely to perceive social problems as threats rather than challenges. This negative mindset makes it difficult for students to generate constructive solutions, leading to avoidance or aggressive responses to interpersonal issues. Hierarchical multiple regression analyses were conducted to reveal the predictors of SBO among Turkish secondary students [5]. The study revealed the importance of the perceived school experiences, the confidence in SPS and self-disclosure and loyalty in peer relationships.

SPS is also considered a way of coping with burnout situations, which means that positive problem orientation and an effective SPS can serve as a protective factor,

reducing the chances of burnout occurring [29]. Research with high school students suggests that problem-focused styles have a positive effect on SBO, whereas SPS aimed at alleviating one's own feelings does not reduce symptoms of SBO [30]. SBO has a negative relationship with rational problem-solving style and a positive relationship with emotion-focused coping [20], as well as a negative relationship with some positive coping strategies (e.g., planned problem-solving, social support seeking) and a positive relationship with procrastination and avoidance [31].

Emotional exhaustion from SBO can lead to poor emotional regulation, which is a critical component of effective SPS. When emotionally drained, students may react impulsively or inappropriately in social situations, which can escalate conflicts and further impair their social relationships [2]. With structural equation modeling, researchers [32] could reveal some factors that have direct and negative effects on SBO among high school students from Turkey. Besides poor self-regulation, the decreased level of perceived autonomy support could increase SBO.

3. Aims and hypotheses

The aim of the research was to explore the relationship between SBO and SPS among Hungarian adolescents (13- and 17-year-olds)—a study of this kind has not been conducted in Hungary using these instruments. The hypotheses were formed on the basis of some previous Hungarian and several international studies described in the theoretical background: (1) cynicism is more characteristic of 13-year-olds, but there is no significant age difference in emotional exhaustion and sense of inadequacy; (2) negative problem orientation and avoidant problem-solving style are more characteristic of 17-year-olds, but there is no significant age difference in positive problem orientation, impulsive and rational problem-solving style; (3) symptoms of SBO are significantly associated with negative problem orientation, impulsive and avoidant problem-solving style at both ages (negative effects on SBO), less so with positive problem orientation and rational problem-solving style (positive effect on SBO); and (4) the latent profile analysis reveals distinct profiles along the factors of the SPS, and these profiles differ along the dimensions of the SBO: where negative problem orientation and avoidant problem-solving style predominate, the SBO dimensions are more prevalent.

4. Method

4.1 Sample

Participants in the study were 13-year-olds (7th graders, n = 144, M = 13.01, SD = 0.18; girls 51.40%) and 17-year-olds (11th graders, n = 152, M = 17.02, SD = 0.23; girls 52.61%) in Hungary. The 7th graders were in eight years of primary school, the 11th graders in four years of high school. The two samples did not differ in terms of educational level of either mother (Pearson $\chi^2 = 0.243$, df = 5, p = 0.901) or father (Pearson $\chi^2 = 1.05$, df = 5, p = 0.958).

4.2 Instruments

Two questionnaires were used in the study: (1) School Burnout Inventory (SBI; [16]; Hungarian version: [17]) and (2) Social Problem-Solving Inventory-Revised

(SPSI-R; [22]; Hungarian version: [33]). Both questionnaires have appropriate psychometric indicators in previous research in Hungary, and both measures reliably at the ages studied [4, 17, 33].

The SBI consists of eight items and measures three symptoms of burnout: (1) *emotional exhaustion* (e.g., I think about school a lot even in my free time), (2) *cynicism* (e.g., I feel like I'm losing interest in school), and (3) *sense of inadequacy* (e.g., I often feel unsuccessful in schoolwork). Statements are rated on a six-point scale (1 = Not at all typical of me, 6 = Totally typical of me). The reliability of the SBI (Cronbach's α) is good at both ages (13-years: 0.821, 17-years: 0.823) in this study.

The SPSI-R consists of 25 items, grouped into five factors: (1) *positive problem orientation* (e.g., Solving a problem is a challenge for me), (2) *negative problem orientation* (e.g., When I have to make a decision, I feel nervous and uncertain), (3) *rational problem-solving style* (e.g., When I have to solve a problem, the first thing I do is to learn as much as I can about the problem), (4) *impulsive problem-solving style* (e.g., When I have to make a decision, I do not think through the options carefully), and (5) *avoidant problem-solving style* (e.g., I do everything I can to avoid dealing with my problems). The statements are rated on a five-point scale (1 = Not at all true for me, 5 = Absolutely true for me). The reliability of the SPSI-R (Cronbach's α) is appropriate at both ages (13-years: 0.715, 17-years: 0.756).

4.3 Data collection and analyses

The research was conducted in 2023. Five classes of primary and secondary schools in Hungary participated in the research, which is part of a larger study funded by the Hungarian Academy of Sciences. An important criterion in the selection of the sample was the type of municipality (students from schools in cities with county status, cities without county status and municipalities), and students who had not participated in social–emotional competence development in the past year.

The data collection took place during classes, using a paper-based questionnaire. Students were given one teaching hour (45 minutes) to complete the two questionnaires and to fill in the background variables (sex, educational level of mother and father). The data collection was supervised by psychology students who were trained in data collection. The participants were informed about the goals of the study, and they were encouraged to ask any survey-related questions. Any student could have withdrawn from the study without any consequences. Every participant answered all items of the questionnaire, therefore, there was no need to exclude any of them from the analysis.

The data were analyzed using Jamovi 2.3.28 and SPSS 26. Cronbach's α was chosen as the reliability indicator for the questionnaires. The data on background variables were analyzed using the χ^2 test. Differences by age were examined using an independent sample t-test. Pearson correlation analysis was performed to explore the relationship between the measured factors. Linear regression analysis was performed to explore which SPSI-R factor predicts the SBI factors and the SBI total. A latent profile analysis (LPA) was performed to identify latent subpopulations within the population (RMM: Rasch measurement model). The models were compared using Akaike information criterion (AIC), Bayesian information criterion (BIC) and bootstrapped likelihood ratio test (BLRT) p-values. Analysis of variance (ANOVA, Tukey's post-hoc test) was used to test whether the resulting profiles differ from each other.

4.4 Ethical aspects

The research was approved by the Ethics Committee at the University of Szeged Doctoral School of Education (ethics approval number 2021/5). Principal and parental permission was obtained to collect the data, and the students gave written consent to participate. Data collection was anonymous.

5. Results

5.1 Age differences between SBO and SPS

First, we compared the two age subsamples along the means of the SBI and SPSI-R factors (**Table 1**). In addition to the factors, we also examined variation by the total score of SBI (SBI-ts).

Based on the independent sample t-test with SBI factors (**Table 1**), 13-year-olds are more likely to be emotionally exhausted ($t = 2.119$, $p = 0.035$), but there is no significant age difference between the two subsamples for cynicism and sense of inadequacy. Analysis using the SBI total score (SBI-ts) also shows that SBO—as well as one dimension of SBI, emotional exhaustion—is more prevalent in 13-year-olds than in older students ($t = 2.036$, $p = 0.043$). Based on the SPSI-R factors, impulsive problem-solving style is more common among 13-year-olds ($t = 2.605$, $p = 0.010$), and negative problem orientation ($t = -4.665$, $p < 0.000$) and avoidant problem-solving style ($t = -3.866$, $p < 0.000$) are more common among 17-year-olds. However, there is no significant age difference in positive problem orientation and rational problem-solving style.

5.2 Relationship between measured fields: Correlation and regression analysis

Relationships between SBI factors, SBI total score and SPSI-R factors were explored using Pearson correlation analysis at both ages (**Table 2**). Linear regression

Factor/ SBI-ts	13-years (n = 144)	17-years (n = 152)	Levene		t-test	
	M (SD)	M (SD)	F	p	t	p
C	3.10 (1.49)	2.91 (1.30)	4.007	0.046	n.s.	
SI	3.35 (1.65)	3.06 (1.70)	0.337	0.562	n.s.	
EE	3.10 (1.55)	2.72 (1.45)	3.387	0.067	2.119	0.035
SBI-ts	3.16 (1.23)	2.88 (1.17)	1.536	0.216	2.036	0.043
NO	2.04 (0.74)	2.47 (0.84)	1.024	0.312	−4.665	< 0.000
PO	3.13 (0.67)	3.12 (0.99)	25.278	0.000	n.s.	
R	3.19 (1.02)	3.01 (0.98)	1.278	0.259	n.s.	
I	2.64 (0.66)	2.43 (0.73)	0.338	0.526	2.605	0.010
A	1.99 (0.78)	2.34 (0.77)	0.006	0.940	−3.866	< 0.000

M, SD, Levene, t-test; n.s. = means not-significant; C = Cynicism, SI = Sense of inadequacy, EE = Emotional exhaustion, SBI-ts = School Burnout Inventory total score; NO = Negative problem orientation, PO = Positive problem orientation, R = Rational problem-solving style, I = Impulsive problem-solving style, A = Avoidant problem-solving style.

Table 1.
Age differences by SBI factors, SBI-ts and SPSI-R factors.

Factor/ SBI-ts	C	SI	EE	SBI-ts	NO	PO	R	I	A
C	—	0.427**	0.380**	—	−0.043	−0.088	−0.171*	−0.105	0.021
SI	0.461**	—	0.519**	—	−0.012	−0.020	−0.083	0.011	0.076
EE	0.448**	0.466**	—	—	0.006	0.036	0.035	0.002	0.081
SBI-ts	—	—	—	—	0.022	−0.031	−0.087	−0.046	0.070
NO	0.047	0.058	0.091	0.084	—	−0.006	0.029	0.223**	0.323**
PO	0.000	−0.028	−0.047	−0.032	−0.319**	—	0.689**	−0.082	−0.221**
R	0.043	0.017	−0.057	−0.002	0.311**	0.796**	—	−0.066	−0.243**
I	−0.021	−0.005	0.016	−0.004	0.614**	−0.405**	−0.456**	—	0.442**
A	0.197*	0.157	0.155	0.216**	0.652**	−0.259**	−0.309**	0.661**	—

*Pearson correlation; upper part: 13-year-olds, n = 144, lower part: 17-year-olds, n = 152; *p < 0.05, **p < 0.01; C = Cynicism, SI = Sense of inadequacy, EE = Emotional exhaustion, SBI-ts = School Burnout Inventory total score; NO = Negative problem orientation, PO = Positive problem orientation, R = Rational problem-solving style, I = Impulsive problem-solving style, A = Avoidant problem-solving style.*

Table 2.
Correlations between SBI, SBI total score and SPSI-R.

SPSI-R factors	R^2	F	df1	df2	p
	0.068	6.48	2	148	0.002
	Beta	SE	t	β	p
Intercept	2.487	0.344	7.22		< 0.001
I	−0.392	0.168	−2.34	−0.240	0.0021
A	0.579	0.160	3.60	0.369	< 0.001

n = 152; dependent variable: SBI total score, independent variables: SPSI-R factors; I = Impulsive problem-solving style, A = Avoidant problem-solving style.

Table 3.
Results of linear regression analysis among 17-year-olds.

SPSI-R factors	R^2	F	df1	df2	p
	0.0668	6.41	2	149	0.002
	Beta	SE	t	β	p
Intercept	2.583	0.373	6.93		< 0.001
I	−0.474	0.185	−2.56	−0.268	0.012
A	0.632	0.177	3.57	0.374	< 0.001

n = 152; dependent variable: emotional exhaustion, independent variables: SPSI-R factors; I = Impulsive problem-solving style, A = Avoidant problem-solving style.

Table 4.
Results of linear regression analysis among 17-year-olds.

analysis was used to examine the predictive power of the SPSI-R subscales (independent variables) on the factors of SBI and SBI total score (**Tables 3–4**).

The correlation analyses with SBI and SPSI-R factors (**Table 2**) show that for both 13- and 17-year-olds, one association is significant, and cynicism is a member of both relations. The 13-year-olds have a negative relation with the rational problem-solving style ($r = -0.171$, $p < 0.05$), while the 17-year-olds have a positive relationship with the avoidant problem-solving style ($r = 0.197$, $p < 0.05$). The SBI total score for the 17-year-olds has a positive relationship with avoidant problem-solving style ($r = 0.216$, $p < 0.01$).

Based on the linear regression analysis, for 13-year-olds, neither the SBI total score nor the three SBI factors had significant predictive power for the model constructed from the SPSI-R factors ($p > 0.05$). For the 17-year-old age group, the model significantly predicted the variance of the SBI total score ($F(5, 145) = 2.62$, $p = 0.026$, $R^2 = 0.083$). However, of the five independent variables, only avoidant problem-solving style ($\beta = 0.371$, $p < 0.001$) and impulsive problem-solving style ($\beta = -0.228$, $p = 0.049$) appeared in the model as statistically significant predictors. Therefore, insignificant predictors were excluded from the final model ($F(2, 148) = 6.48$, $p = 0.002$, $R^2 = 0.068$), in which impulsive problem-solving style had a negative ($\beta = -0.240$, $p = 0.021$) and avoidant problem-solving style had a positive ($\beta = 0.369$, $p < 0.001$) relation with SBO (**Table 3**).

For 17-year-olds, for the three SBO symptoms, emotional exhaustion is also predicted to a statistically significant extent by the SPSI-R factors ($F(2, 149) = 6.41$, $p = 0.0002$, $R^2 = 0.0668$). After excluding non-significant predictors (**Table 4**), only avoidant

problem-solving style (β = 0.374, p < 0.001) and impulsive problem-solving style (β = −0.268, p = 0.012) appear as significant predictors in this case. For cynicism and a sense of inadequacy, there is no significant predictive power for the models (p > 0.05).

5.3 Latent profile analysis (LPA) on the whole sample

Finally, latent profile analysis (LPA) was conducted to identify profiles based on scores from SPSI-R factors. The analysis was run to find the optimal class solution (**Table 5**).

The three-class solution was selected based on the analysis (**Table 5**), as the high BLRT p-values indicated that solutions for four, five and six classes do not have significantly better fit compared to the three-class models. The number of participants in the first and third profiles was balanced (in order 36.5 and 44.8%), while there were fewer members included in the second profile (18.8%).

The first profile (**Figure 1**) can be characterized by below-average negative problem orientation, impulsive problem-solving and avoidant problem-solving

Class	AIC	BIC	BLRT p (compared to the previous row)
1	3670	3743	—
2	3547	3697	< 0.001
3	3513	3740	0.019
4	3503	3807	0.317
5	3498	3879	0.336
6	3478	3936	0.296

n = 296; AIC = Akaike information criterion, BIC = Bayesian information criterion, BLRT p = Bootstrapped likelihood ratio.

Table 5.
Results of latent profile analysis on the complete sample.

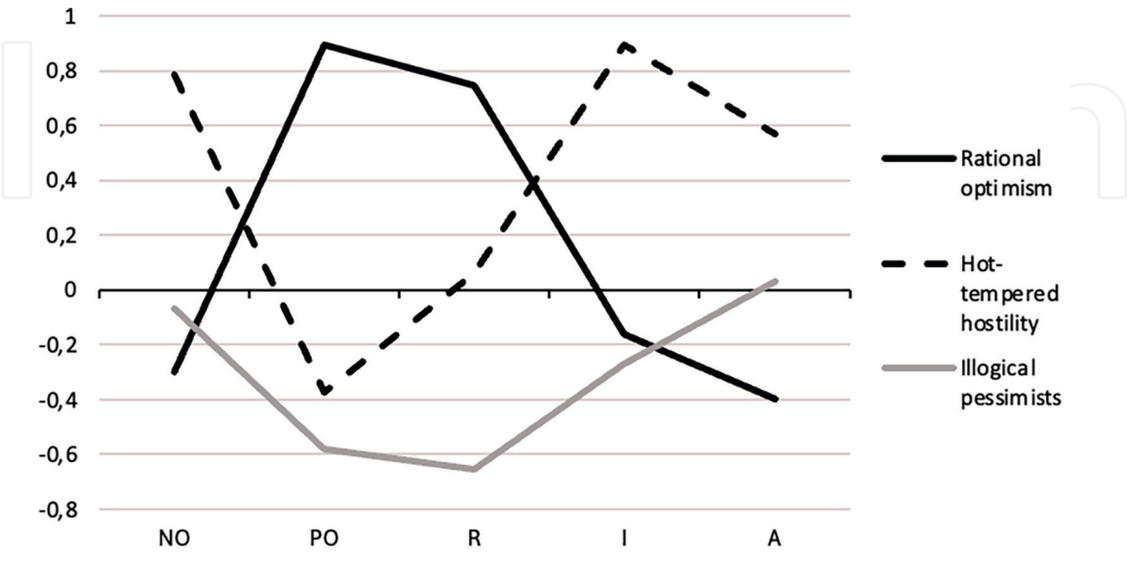

Figure 1.
Averages on SPSI-R subscales (the represented values are z-scores; NO = Negative problem orientation, PO = Positive problem orientation, R = Rational problem-solving style, I = Impulsive problem-solving style, A = Avoidant problem-solving style).

Variable	F	df1	df2	p
SBI-ts	1.435	2	139	0.242
C	3.566	2	146	0.031
SI	0.522	2	144	0.594
EE	0.128	2	146	0.880
Variable	Profile	N	M	SD
C	1	105	2.78	1.373
	2	53	2.87	1.268
	3	129	3.25	1.442

SBI-ts = School Burnout Inventory total score; C = Cynicism, SI = Sense of inadequacy, EE = Emotional exhaustion.

Table 6.
Results of analysis of variance (ANOVA) and descriptive statistics for cynicism scores across profiles.

scores, while positive problem orientation and rational problem-solving are highly represented in this class (rational optimism). The participants in the second profile scored higher than average in negative problem orientation, impulsive and avoidant problem-solving, while lower on positive problem orientation with average rational problem-solving scores (hot-tempered hostility). Therefore, the first and the second profile mirrors each other almost perfectly. The third profile (illogical pessimists) can be characterized by low scores on almost every scale, only negative problem orientation and avoidant problem-solving are average.

The main goal of the analysis was to explore the differences in SBO across the classes created based on the LPA (**Table 6**). Therefore, variance analysis (ANOVA) was used to test whether the three profiles differ. There were no significant differences between the profiles in case of emotional exhaustion, sense of inadequacy and SBI total scores ($p > 0.05$).

On the other hand, the cynicism (**Table 6**) scores of the profiles differed significantly ($F(2; 146) = 3.566$, $p = 0.031$). According to Tukey's post-hoc test, participants in Profile 3 (illogical pessimist, $M = 3.25$) scored significantly higher on cynicism ($p = 0.027$) than members in Profile 1 (rational optimism, $M = 2.78$) and Profile 2 (hot-tempered hostility, $M = 2.87$).

6. Discussion

Adolescence is a key period for the development of social and emotional skills and strategies that are important for mental well-being, such as coping, SPS and emotion regulation. Schools need to play a role in helping (to develop) these areas, as many studies show that a significant proportion of families have little or no capacity to do so, for social, family and individual reasons, among others [34, 35]. However, unless the characteristics of these skills and strategies and their relationship with other fields are known, there can be no effective school-based management of mental health, which can not only cause serious cognitive and non-cognitive problems in adolescence but can also have a significant negative impact on adult functioning. It should also be considered that the more risk factors students are exposed to, the greater the negative impact on their mental health. Stress is one of the biggest risk factors for both

children and adults today. Factors leading to stress include burnout at school, which can make life difficult for adolescents in several areas, both cognitive (e.g., academic anxiety) and non-cognitive (e.g., low self-efficacy) [36, 37].

For school support to be successful, it is important that students have a fundamentally positive attitude toward the school, teachers and peers, and that they do not have significant negative attitudes toward the school. The results of some studies [17, 38] have shown that stronger school attachment plays a protective role against SBO [17, 38]. The strength of school attachment is influenced by several factors, one of the most prominent of which is the quality of relationships with teachers and peers, and the successful SPS that arises is crucial for the development of high-quality peer relationships [39]. This suggests that effective SPS (positive problem orientation and rational problem-solving style) leads to better peer relationships and stronger attachment, which is negatively correlated with SBO.

It can be clearly seen that SPS and SBO are directly related and indirectly related through several other domains. We have investigated a small slice of this complex relationship among 13- and 17-year-olds. The results of our cross-sectional study show that SBO (based on the SBI total score) is higher among 13-year-olds, and that, contrary to our hypothesis, they also have higher average scores for emotional exhaustion. In previous Hungarian study [17], adolescent students scored high on cynicism. Also, impulsive problem-solving style is more typical for 13-year-olds, which has been identified in several Hungarian cross-sectional and longitudinal studies [4] mainly in older students (14–16-year-olds). However, consistent with the hypothesis, negative problem orientation and avoidant problem-solving style are more typical of the older adolescents in this research. The different results may be explained by several other psychological characteristics not yet investigated, their interaction (e.g., anxiety) or differences in environmental factors (e.g., family structure and mechanisms).

The relationship between SBO and SPS has not yet been studied in Hungary. Because of this, we could only rely on international data to formulate the hypothesis, considering that in addition to personality, the relationship between SBO and SPS is also determined by several family and wider environmental characteristics, such as school. Correlation analysis shows that cynicism is negatively related to rational problem-solving style in 13-year-olds and positively related to avoidant problem-solving style in 17-year-olds. Cynicism is thought to be a defense mechanism developed by adolescents who are not successful in solving peer problems, due to intense emotional stress, and who choose avoidance strategies. Several studies have shown that adolescents who have a positive attitude toward their interpersonal problems (high self-efficacy), a fact-focused, assertive approach to SPS and sufficient social support from those around them can develop effective interaction with others and reduce risk of SBO [24, 40]. At the same time, avoidance increases the stress on the individual, which may explain some of the emotional exhaustion, as indicated by the regression analysis results.

We highlighted the relationship between SPS and SBO in the theoretical background, that SPS (positive and negative orientation, rational, impulsive and avoidant problem-solving style) can predict SBO (cynicism, emotional exhaustion, sense of inadequacy). Based on this, we hypothesized a negative effect of negative problem orientation, impulsive and avoidant problem-solving styles, and a positive effect of positive problem orientation and rational problem-solving style at both ages. The results of the linear regression analysis show that for 13-year-old students, SPS does not predict symptoms of SBO, whereas for 17-year-olds, these two psychological areas are more strongly associated. One possible explanation for this is age-related.

For 17-year-olds, social relationships with peers become more important, but their cognitive development also strengthens their critical perspective, and their evolving and growing autonomy aspirations and identity formation also tend to lead to more frequent conflicts with their peers. Less adaptive ways of SPS (avoidant and impulsive problem-solving styles) may therefore predict SBO, especially its emotional aspect, emotional exhaustion.

Latent profile analysis focuses on identifying latent subsamples within a population based on certain variables. Such an analysis has already been performed on a Hungarian sample of SPS [41], and the profiles obtained there show a high degree of similarity with the profiles obtained here. We were able to allocate three profiles (rational optimist, hot-tempered hostility and illogical pessimists) from the total sample. The rational optimist with below-average negative problem orientation, impulsive and avoidant problem-solving styles, but high rational problem-solving style and positive problem orientation, is markedly distinguished. The opposite is the hot-tempered hostility, characterized by high negative problem orientation, impulsive and avoidant problem-solving styles, low positive problem orientation and average rational problem-solving style. For illogical pessimists, negative problem orientation and avoidant problem-solving style are average, while positive problem orientation, rational and impulsive problem-solving styles are low. These SPS profiles diverged significantly based on cynicism, and in line with the hypothesis with students in the illogical pessimism profile showing a greater degree of this than students in the rational optimism and hot-tempered hostility profiles. This fully confirms the link between SBO and avoidance behavior identified so far [31, 42].

Overall, the results support the conclusions drawn from previous research that individual and group school programs aimed at preventing or reducing SBO should include the development of SPS [4, 5]. Rational problem-solving styles (focusing on facts, considering consequences, assertive communication, considering others' perspectives and taking responsibility) need to be strengthened, as they appear to be protective factors against some symptoms of SBO and in promoting school well-being. A Finnish study [43] found that coping strategies that focus on SPS and seeking social support are associated with fewer burnout symptoms. A positive school climate also shows a similar relationship with SBO. Since rational problem-solving style shows a close relationship with cognitive abilities (e.g., inductive and deductive reasoning), this also shows the importance of developing cognitive and non-cognitive domains together [4]. However, a strong emphasis should be placed on both reducing various forms of avoidance and preventing the development of avoidant attitudes and behaviors.

7. Limitations and future research

Our research was conducted on a relatively small sample size, which is not representative of the whole population. Furthermore, the cross-sectional design does not allow us to infer developmental characteristics or causal relationships between factors. However, our results suggest that it is worth further analyzing the relationship between SPS and SBO, primarily along the dimensions of cynicism and emotional exhaustion. It would be important to repeat the study on a larger sample and in a longitudinal design. In the future, a comparative cultural study should examine how the results relate to the characteristics of the school system in each country. Person-oriented analyses may point to an optimal pattern of SPS, which is associated with

lower SBO scores. If the SPS profiles now obtained can be identified in a larger sample through further research in Hungary, the profiles will contribute significantly to targeted school improvement. In the future, it would certainly be important to conduct studies comparing students with high and low SBO levels. This information could also contribute to effective help for students with high burnout.

Acknowledgements

The research was supported by the Research Programme for Public Education Development: Hungarian Academy of Sciences—University of Szeged School Failure Prevention Research Group, Hungary.

Conflict of interest

The authors declare no conflict of interest.

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