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To cite this article: Anett Balogh-Pécsi, Edit Tóth & László Kasik (2024) Social problem-solving, coping strategies and communication among 5<sup>th</sup> and 7<sup>th</sup> graders, International Journal of Adolescence and Youth, 29:1, 2331592, DOI: [10.1080/02673843.2024.2331592](https://doi.org/10.1080/02673843.2024.2331592)

To link to this article: <https://doi.org/10.1080/02673843.2024.2331592>



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Published online: 19 Mar 2024.



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# Social problem-solving, coping strategies and communication among 5<sup>th</sup> and 7<sup>th</sup> graders

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## ABSTRACT

The aim of the study is to explore the characteristics of social problem-solving, coping strategies and assertive communication among 5<sup>th</sup>- and 7<sup>th</sup>-grade students ( $N=378$ ). Communication is assessed with the Assertiveness Questionnaire (AQ, Gaumer Erickson et al., 2016), social problem-solving with the Social Problem-Solving Inventory – Revised (SPSI – R, D’Zurilla et al., 2002) and coping strategies with the Ways of Coping Questionnaire (WCQ, Lazarus & Folkman, 1988). The results show that mostly significant differences can be found between pre-adolescents and early adolescents in the three social fields. Low belief in problem-solving is more common among older students, and – besides the age difference – there are a number of areas where boys and girls differ, even among younger students. The SEM clearly identifies strong links between communication, coping strategies and problem solving. The results provide a more nuanced picture of boys’ social problem-solving, coping strategies and communication and the relation between them than before.

## ARTICLE HISTORY

Received 21 June 2023  
Accepted 12 March 2024

## KEYWORDS

Social problem-solving; coping strategies; communication; adolescence; 5th and 7th graders; differences between boys and girls

## Introduction

Effective communication plays an important role both in solving social problems and in coping with difficult situations (Erozkan, 2013). Children for whom the communication patterns of the primary socialization environment, the family, are inadequate (for example impulsive and aggressive communication, ignoring the child’s needs, low empathy by parents and/or siblings), experience a myriad of difficulties in school, or in other communities in relation to their social problems (Denham et al., 2012; Reid et al., 2007). On the basis that family education is not effective for all children, studies point to the need for school-based development programmes that may have a complex impact on the positive development of children’s personalities through the combined development of social-emotional-cognitive areas (Webster-Stratton, 2011; Zsolnai, 2013). Since the use of verbal and non-verbal means of communication, and the style of communication, depends to a large extent on the functioning of different social-emotional skills, programmes tend to be communication-focused.

In Hungary, we are not aware of any research and development programme that would jointly investigate and develop social problem-solving (SPS), coping strategies and communication. As previous national research (e.g. Kasik, 2014) suggests that this age is the first to show significant changes in both SPS and coping, the aim of our research was to investigate these three areas among

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students aged 10–11 (5th grade) and 12–13 (7th grade). The results will be used to develop a programme to improve these areas in autumn 2023.

A growing number of studies emphasize the importance of identifying sex differences as accurately as possible in addition to age-specific differences, and in this study we also considered it important to identify sex differences within the constraints of the sample. Previous research has shown that differences between boys and girls can be identified at a very early age in all three domains. This means that, based on the results of the research, the development process will take into account the potentially different characteristics of girls and boys when choosing and using methods (Perzow et al., 2021).

## Theoretical background

### *Social problem-solving, coping strategies and communication style*

SPS is a widely researched area of social functioning, which has given rise to a number of theoretical models (e.g. D’Zurilla et al., 2004; McMurrin & McGuire, 2005). One of the most widely used definitions was developed by D’Zurilla et al. (2004, p. 12): SPS is a ‘self-directed cognitive-behavioural process by which an individual, couple or group attempts to identify or discover effective solutions for specific problems encountered in everyday living.’ According to Maydeu-Olivares and D’Zurilla (1996), there are five different factors in SPS: a negative and a positive problem orientation (attitude and response to problems and problem solving), as well as problem-solving styles marked by rationality, impulsivity and avoidance. The Social Problem Solving Inventory – Revised (D’Zurilla et al., 2004) measures these five factors.

Negatively oriented people have low self-efficacy and a lack of confidence in their ability to solve a problem compared to positively oriented people (Chang et al., 2004). Orientation is a fundamental determinant of problem-solving style. Correlation and regression analyses show that negatively oriented individuals tend to have an impulsive or avoidant SPS style, while positively oriented individuals most often have a rational SPS style, and a negative orientation is usually associated with an impulsive or avoidant SPS style, while a positive orientation is most often tied to a rational SPS style. These relations can be identified before adolescence (Chang et al., 2004; D’Zurilla & Nezu, 2007; Kasik, 2014; D’Zurilla et al., 2002), and these characteristics become increasingly situation- and person-specific with age.

A rational problem-solver has positive thoughts and feelings when faced with a problem situation, puts facts first and considers several alternative options. A positively oriented and rational problem-solver is characterized by a high degree of empathetic concern and perspective taking (Chang et al., 2004; Siu & Shek, 2005). An impulsive problem-solver is primarily driven by negative feelings and thoughts against the other party. They only take a few facts into account (especially those that justify them) to find a solution, and their emotions strongly influence their reactions. They are quick to make decisions and less able to consider others’ points of view (Chang et al., 2004, Author, 2014; Siu & Shek, 2005). For an avoidant problem-solver, it is less clear whether their thoughts and feelings are positive or negative, and this depends to a large extent on the goal of avoidance. It can be complete avoidance; that is, he/she no longer wants to deal with the problem (he/she closes down and/or exits the situation) or he/she delays the solution to gain strength (he/she has the opportunity to deal with it again). It is also common for an avoidant to shift responsibility to others or to become subordinate to them (D’Zurilla et al., 2002; Kasik et al., 2018).

A positive problem orientation is generally associated with a rational style and a negative problem orientation with impulsive and avoidant styles, but a rare pattern of a negative problem orientation associated with high rationality has been observed mainly among boys, with avoidance as a third pattern, and mainly among those with at least one sibling (Kasik, 2014, 2015). The negative orientation-rationality-avoidance link suggests that negative attitudes may have positive characteristics for the individual that do not result in an end (immediate avoidance with strong impulsivity) or that negative attitudes are not immediately followed by avoidance (avoidance is the result of a conscious, considered decision).

Coping strategies are the behavioural or cognitive efforts that individuals engage in to cope with stressful life events (Lazarus & Launier, 1978). Coping strategies can have different styles, such as problem-focused (e.g. managing or solving the problem, and re-evaluating and attaching positive meaning to the stressor), emotion-focused (e.g. avoidance, denial, expressing negative emotions, attributing blame and withdrawing from the problem), may have a religious, spiritual basis and can be directed towards social support (e.g. emotional or instrumental social support) (de Almeida Santos, 2023; Lourencão et al., 2022).

According to de Almeida Santos (2023), SPS involves ways of coping and cognitive effort to regulate emotion and manage situations. T. J. D'Zurilla and Nezu (2007) believe that SPS styles are not the same as coping strategies and that not all coping is SPS; however, when the social problem is evaluated as a stressor, the SPS process can be linked to emotion-focused and problem-focused coping strategies, as described by Lazarus and Launier (1978). In their model, which integrates problem-solving and coping, D'Zurilla and Nezu (2007) distinguish three components: (1) a stressful situation, (2) emotional distress and (3) problem-solving coping. A stressful situation can be a social problem (e.g. a conflict of values/interests) or a major negative life event (e.g. divorce or death). Emotional distress is the emotional response of an individual in a stressful situation, which can be negative (one's safety is threatened) or positive (one believes that one's efforts are successful and that one is able to change the situation). Problem-solving coping illustrates the relationship: forms of emotion-focused strategies (e.g. avoidance, denial and expressing negative emotions) are closely related to impulsive and avoidant styles, and forms of problem-focused strategies (e.g. confrontation, social support, managing or solving the problem, and re-evaluating and attaching positive meaning to the problem situation) are closely linked to a rational style. Lazarus and Folkman (1986) point out that coping strategies can overlap in each social situation. D'Zurilla and Nezu (2007) emphasize that this can lead to an overlap in coping styles. At the behavioural level, overlap is most often identified in the avoidant coping style, i.e. it is the form that can manifest itself in a wide variety of behaviours depending on how impulsive, rational and avoidant style elements are combined (e.g. anxious or calm avoidance of the problematic situation, angry or calm exit from the problem-solving process, procrastination in the face of ineffective anxiety, deliberate procrastination to gather strength and return to the solution).

Communication styles – both verbal and non-verbal – play a significant role in SPS and coping (Erozkan, 2013). The communication style among problem-focused, positively-oriented individuals is the assertive style (Pipas & Jaradat, 2010). These individuals are able to express their thoughts and needs calmly in difficult circumstances, respect others' views and are curious about others' intentions (Gaumer Erickson et al., 2018; Hadfield & Hasson, 2015). Negative feelings and thoughts often result in aggressive and passive-aggressive (manipulative) communication styles. Aggressive communication is the opposite of assertive. A passive-aggressive person expresses anger and tension towards others indirectly (e.g. silent resistance, sarcastic humour and gossip). The latter communication style can also be a prominent feature of an avoidant problem-solver but is more often characterized by a submissive and passive communication style. A passive style can often be considered identical to a subordinating one, but a passive communicator keeps a considerable distance from problematic situations, avoids them and does not want to face them, while a subordinating communicator subordinates his/her own needs and desires to the needs of others, often fearing humiliation (Mészáros, 2011).

### ***SPS and coping in (pre-)adolescence***

Attitudes to social problems and coping strategies are influenced by several personality (e.g. temperament, frustration tolerance), environmental (e.g. family pattern) and biological (brain function and develop) factors (Kelly et al., 2008): among cognitive characteristics as parts of personality, for example, the ability to draw conclusions about internal states, the quality and durability of learning through observation of others, awareness of behaviour and perspective taking. According

to Siu and Shek (2005), perspective taking is more effective for a rational style than for an impulsive style in adolescence. Psychological changes include increased risk-taking, increased sensation-seeking and illusions of invulnerability (Arnett, 1992), the latter being associated with a greater tendency towards impulsivity in adolescence. Different subcortical systems in the brain are responsible for the prevalence of impulsive behaviour. These include the hippocampus, the amygdala and the nucleus accumbens. In adolescence, these areas of the brain develop more intensively and rapidly than the cerebral cortex, so emotions play a greater role in decision-making than rational thinking at this age. At the same time, this way of thinking may have explicit benefits in adolescence (e.g. in forming new relationships and pushing self-boundaries) (Greene et al., 2000).

Based on several studies (D’Zurilla et al., 2002, Author, 2014; Author et al., 2018; Siu & Shek, 2005), the pre-adolescent period presents a more consistent picture than the adolescent period. It shows that they tend to have a more positive attitude towards their problems and – although there are significant individual differences in their problem-solving styles – they are less avoidant and impulsive than in adolescence. A significant change is identified from 12 to 13 years of age. A negative orientation is more prevalent in that age group, while a positive orientation is less prevalent and more common among girls, in which case it is often associated with anxiety. Rationality and avoidance become more frequent from the age of 12–13, but there is a significant cultural difference in whether they are higher for boys or girls. The development of several cognitive abilities (e.g. inductive and deductive reasoning) plays a significant role in the increase in the frequency of rational style. An impulsive style is increasingly higher between the ages of 12–13 and 18–19 and varies greatly between the sexes, which is very often explained by family background and the psychological characteristics of the family (e.g. higher scores in case of those who do not live with both parents but regardless of whether the child lives with the mother or father; negative life events in the family; parental impulsivity) (T. J. D’Zurilla et al., 2002; Author, 2014).

Adolescents use more coping strategies as they age, they use more emotion-based strategies before adolescence than later, and solving social problems increases the probability of coping adaptation and reduces the daily difficulties of life (Williams & McGillicuddy De Lisi, 1999). This depends to a large extent on the source of the stress, as does the problem situation for problem-solving. Sex differences in the use of emotion- and problem-focused coping strategies are also indicated in adolescence, though research findings are mixed. There are fewer sex differences in the frequency of use of a coping strategy in pre-adolescence than in adolescence, and the characteristics identified in adolescence may change significantly by young adulthood. Most research with adolescents shows that girls are more likely to use emotion-focused coping, they are more likely to seek a more peaceful solution to a problem, and more ask others for help but also confront each other more often, in the process of which their more developed assertive communication plays a significant role. For boys, it is not so clear whether they are more likely to use emotion- or problem-focused coping. Boys are more concerned about who the problem is related to and who the other party is and thus change strategies more quickly, which requires, among other things, advanced perspective taking, while more empathy research emphasizes that more effective perspective taking is characteristic of girls. According to Eschenbeck et al. (2007), girls scored higher in seeking social support and problem-solving, whereas boys scored higher in avoidant coping in adolescence. In contrast to Hampel and Petermann (2005), no sex differences occurred for emotion regulation among adolescents.

## Aims and hypotheses

The research investigated (1) the characteristics of students’ SPS, coping strategies and assertive communication (1a: age; 1b: sex differences); and (2) relationship between the measured factors (correlation analysis by sex), and how the forms of assertive communication (expressing one’s own needs feelings and thoughts; listening to others) affect coping strategies and, through them, the operation of social problem-solving (SEM by whole sample).

(1a) Based on the research findings, we formulated the hypothesis. Previous studies (Author, 2014, 2015; Siu & Shek, 2005) have suggested that 10–11-year-olds have a more positive attitude towards problem situations, while older students are more rational (more typical of girls) but also more impulsive and avoidant (both more typical of boys). We assume that older students use problem-focused strategies more often and that, among the older students, girls are more confrontational with others and more peer supportive (Williams & McGillicuddy De Lisi, 1999). As regards communication, we presume that there is no age difference in the expression of self-needs but that older students are more other-focused and that girls achieve higher scores in both measured fields (Gaumer Erickson et al., 2018; Hadfield & Hasson, 2015).

(1b) Research findings are contradictory about the differences between boys and girls in these areas (von Hippel et al., 2011). Presumably significant cultural characteristics (resulting parenting styles and parental/educational beliefs) explain the differences, but in general – and this is assumed in this study –, girls tend to be more rational, boys more impulsive and avoidant social problem solvers. Based on the previous research, we also assume that older girls tend to use problem-focused coping strategies, confront more quickly than boys, and use assertive communication more often (Nortenson, 2002; von Hippel, Wiryakusuma, Bowden, & Shochet, 2011). Research on school development increasingly emphasizes the need to make use of these non-similar differences in development, i.e. that these differences require different development to a greater or lesser extent (Kilby, 2023).

(2) Based on the results of early research (Adler et al., 1993; Tenenbaum, Ford, & Alkheldairy, 2011), close relation is assumed between the measured fields. A great deal of research has shown that a positive orientation and rational style are closely related to expressing one's own needs and listening to others, both based on the use of assertive means of communication, and are not related or negatively related to a negative orientation, impulsivity or avoidance. The relation between SPS and coping strategies is thought to be positive. Studies have shown the following: reappraisal, social support seeking, distancing-acceptance and planned problem-solving are tied to a positive orientation, rational coping style and escape-avoidance; withdrawal-loss of control and help-seeking are more closely linked to a negative orientation and avoidance; and confrontation is more closely related to a positive orientation and rational problem-solving style (T. J. D'Zurilla & Nezu, 2007; T. J. D'Zurilla et al., 2002).

## Method

### Sample

Participants in the study were students from Hungary aged 10–11 years ( $M = 10.64$ ,  $SD = .71$ ) and 12–13 years ( $M = 12.54$ ,  $SD = .56$ ) ( $N = 378$ ). They all spoke Hungarian as a native language. Before the study, they had not participated in a socio-emotional development programme. Table 1 illustrates the characteristics of the sample.

The background data was provided by the students. The two subsamples are similar in terms of sex ratio, parental educational level and number of siblings (Table 1). There is no difference between the proportion of boys and girls in the two subsamples (Pearson's  $\chi^2$  (376) = .007,  $p = .933$ ) or in parents' educational level (Pearson's  $\chi^2$  (376) = 9.82,  $p = .631$ ). Almost half of the students have one sibling and one third of them have two siblings in both samples; there is no difference between the subsamples (Pearson's  $\chi^2$  (376) = 1.50,  $p = .681$ ).

### Data collection and analyses

The data were collected after permission was granted by the principal and parents. The students completed the questionnaires in two lessons. Cronbach's  $\alpha$  was chosen as the reliability indicator for the questionnaires. The data on background variables were analysed using the  $\chi^2$  test (parents' educational level and number of siblings). Differences by age and sex were examined using t-tests. Correlation

**Table 1.** Characteristics of sample ( $N = 378$ ).

Characteristic/age group	10–11-year-olds ( $n = 182$ )		12–13-year-olds ( $n = 196$ )	
Sex $n$ (%)				
Boy	89 (48.8)		95 (48.4)	
Girl	93 (51.2)		101 (51.6)	
	Mother	Father	Mother	Father
Parents' educational level $n$ (%)				
None	12 (6.5)	12 (6.9)	15 (7.6)	14 (7.1)
Elementary school	11 (6.2)	21 (11.6)	14 (7.1)	22 (11.2)
Vocational secondary school	28 (15.3)	35 (19.5)	32 (16.3)	33 (16.8)
High school	46 (25.7)	33 (17.5)	51 (26.1)	47 (23.9)
College or university	85 (46.3)	81 (44.5)	84 (42.8)	80 (40.8)
Number of siblings $n$ (%)				
None	12 (6.5)		16 (8.2)	
1	80 (43.8)		85 (43.3)	
2	68 (37.2)		65 (33.1)	
3 or more	22 (12.5)		30 (15.4)	

analysis was performed to explore the relationship between the factors. Given the number of items in the sample, a Bonferroni correction was applied, reducing the risk of a type I. error.

Based on Pearson's correlation analysis ( $z$ -test) structural equation modelling (SEM) was used to analyse the relationship between the different social problem-solving, coping strategies and assertive communication.

### Instruments

Communication was assessed with the Assertiveness Questionnaire (AQ, Gaumer Erickson et al., 2016; Balogh-Pécsi & Kasik, 2020), SPS with the Social Problem-Solving Inventory – Revised (SPSI – R, D'Zurilla et al., 2002; Kasik et al., 2010) and coping strategies with the Ways of Coping Questionnaire (WCQ, Lazarus & Folkman, 1988; Rózsa et al., 2008).

*SPSI – R.* The questionnaire consists of 25 items, and the statements are rated on a five-point scale (1 = Not at all true for me – 5 = Absolutely true for me). The statements are grouped into five factors: (1) a positive orientation (e.g. Solving a problem is a challenge for me); (2) a negative orientation (e.g. When I have to make a decision, I feel nervous and uncertain); (3) rationality (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) impulsivity (e.g. When I have to make a decision, I don't think through the options carefully); and (5) avoidance (e.g. I do everything I can to avoid dealing with my problems).

*WCQ.* The questionnaire consists of 22 items which are rated on a four-point scale (1 = Not typical – 4 = Very typical). It consists of seven factors: (1) positive reappraisal (e.g. The situation inspired me to do something creative); (2) avoidance (e.g. I tried to help myself by eating, drinking, smoking, or taking tranquilizers or medication); (3) social support seeking (e.g. I accepted the sympathy and understanding of others); (4) distancing-acceptance (e.g. I tried to forget about it all); (5) confrontation (e.g. I expressed my anger towards the person who caused the problem); (6) planned problem-solving and self-control (e.g. I knew what I had to do, so I redoubled my efforts to succeed); and (7) withdrawal-loss of control and asking for help (e.g. I blamed myself).

*AQ.* The questionnaire contains 20 statements to be rated on a five-point scale (1 = Not at all typical of me/I hardly ever do this – 5 = Totally typical of me/very often). The items are grouped into two factors: (1) expressing my own needs, feelings and thoughts and (2) listening to others. Six of the items on the questionnaire are reversed; they are passive (e.g. I often find it hard to say no), manipulative (e.g. I don't talk about my feelings and I prefer to hide my feelings) and aggressive (e.g. When I'm hurt, I find it hard to control my feelings), while the others are all assertive (e.g. I try not to offend anyone I disagree with).

**Table 2.** Results of reliability analysis (Cronbach's  $\alpha$ ).

Students' age: questionnaire (number of items)	Cronbach's $\alpha$ (whole questionnaire)
10–11: AQ (20)	.83
12–13: AQ (20)	.87
10–11: SPSI – R (25)	.89
12–13: SPSI – R (25)	.88
10–11: WCQ (22)	.80
12–13: WCQ (22)	.81

Table 2 illustrates the reliability indicators (Cronbach's  $\alpha$ ) along the age group and the full questionnaire. In all cases, the indicators are good.

### Disclosure of interest

The authors report no conflict of interest.

## Results

### Age and sex differences

Based on the results of the t-test, a positive orientation is significantly lower among older students, while a negative orientation, impulsivity and avoidance are higher (Table 3). For rationality, there is no significant difference between the two age groups.

In both age groups, rationality is more characteristic of girls (10–11-year-olds:  $M_{\text{boys}} = 3.11$ ,  $M_{\text{girls}} = 3.47$ ,  $t = -2.22$ ,  $p = .020$ ; 12–13-year-olds:  $M_{\text{boys}} = 3.10$ ,  $M_{\text{girls}} = 3.42$ ,  $t = -2.27$ ,  $p = .018$ ). Among younger students, impulsivity ( $M_{\text{boys}} = 2.81$ ,  $M_{\text{girls}} = 2.47$ ,  $t = 3.18$ ,  $p = .002$ ) and avoidance ( $M_{\text{boys}} = 2.35$ ,  $M_{\text{girls}} = 1.81$ ,  $t = 3.99$ ,  $p = .001$ ) are more characteristic of boys, and older boys scored significantly higher on avoidance ( $M_{\text{boys}} = 2.53$ ,  $M_{\text{girls}} = 2.11$ ,  $t = 3.67$ ,  $p = .002$ ).

The results of the t-test show that positive reappraisal, avoidance, confrontation, and planned problem-solving and self-control are more common among older students (Table 3). There is no significant age difference for social support seeking, distancing-acceptance and

**Table 3.** Characteristics of social problem-solving, coping strategies and communication.

Factor	10–11-year-olds ( $n = 182$ ) M (SD)	12–13-year-olds ( $n = 196$ ) M (SD)	t (p)
<b>Social problem-solving</b>			
Positive orientation	3.24 (.67)	2.87 (.76)	5.03 (.001)
Negative orientation	2.03 (.77)	2.89 (.67)	-11.56 (.001)
Rationality	3.31 (.96)	3.26 (.88)	.73 (.461)
Impulsivity	2.04 (.54)	2.52 (.45)	-9.34 (.001)
Avoidance	2.08 (.82)	2.33 (.34)	-3.89 (.002)
<b>Coping strategies</b>			
Positive reappraisal	2.29 (.60)	2.50 (.59)	-2.08 (.030)
Avoidance	2.48 (.81)	2.69 (.75)	-1.86 (.048)
Social support seeking	2.50 (.66)	2.57 (.63)	-1.05 (.291)
Distancing-acceptance	2.34 (.45)	2.44 (.61)	-1.82 (.062)
Planned problem-solving and self-control	2.54 (.69)	2.78 (.96)	-2.55 (.022)
Withdrawal – loss of control and asking for help	1.79 (.61)	1.85 (.51)	-1.21 (.022)
Confrontation	1.64 (.54)	2.02 (.76)	-2.13 (.041)
<b>Communication</b>			
Expressing own needs, thoughts and feelings	3.22 (.56)	3.44 (.63)	-3.57 (.001)
Listening to others	3.33 (.85)	3.49 (.59)	-2.11 (.043)



withdrawal – loss of control and asking for help. The value for confrontation is higher for girls in both age groups (10–11-year-olds:  $M_{\text{boys}} = 1.71$ ,  $M_{\text{girls}} = 2.10$ ,  $t = -2.53$ ,  $p = .023$ ; 12–13-year-olds:  $M_{\text{boys}} = 1.86$ ,  $M_{\text{girls}} = 2.26$ ,  $t = -2.34$ ,  $p = .045$ ), avoidance is higher for older boys ( $M_{\text{boys}} = 3.03$ ,  $M_{\text{girls}} = 2.19$ ,  $t = 4.01$ ,  $p = .018$ ), and planned problem-solving and self-control is higher for older girls ( $M_{\text{boys}} = 2.60$ ,  $M_{\text{girls}} = 2.90$ ,  $t = -3.56$ ,  $p = .016$ ).

As regards communication (Table 3), there are also significant differences between the two age groups in both factors (expressing own needs, thoughts and feelings, and listening to others) based on the t-test. Listening to others is more characteristic of girls in both age groups (11–12-year-olds:  $M_{\text{boys}} = 3.19$ ,  $M_{\text{girls}} = 3.47$ ,  $t = -1.96$ ,  $p = .041$ ; 12–13-year-olds:  $M_{\text{boys}} = 3.10$ ,  $M_{\text{girls}} = 3.66$ ,  $t = -2.43$ ,  $p = .021$ ).

We examined whether there were significant differences between the age groups based on number of siblings (see Table 1) in terms of SPS, coping strategies and communication factors. There were no significant differences ( $p > .05$ ) between groups for any of these factors.

### **Relation between SPSI – R, AQ and WCQ factors by sex**

We examined the relation between the SPSI factors and other factors in both age groups for the boys and girls. The results of Pearson correlation analysis are illustrated in Table 4 (10–11-year-olds) and 5 (12–13-year-olds). Correlations ( $r$ ,  $p$ ) that are significant between a factor of the SPSI – R and the WCQ and CQ factors are highlighted in bold.

In both age groups, a positive orientation is positively related to planned problem-solving and self-control, and the correlation value identified for boys is stronger in both age groups (11–12-year-olds:  $z = -1.411$ ,  $p = .036$ ; 12–13-year-olds:  $z = -1.392$ ,  $p = .029$ ). When the values for the boys in the two age groups are compared, the correlations are not significantly different ( $z = -1.441$ ,  $p = .153$ ), as is the case with the girls ( $z = -.462$ ,  $p = .329$ ). Also, for both age groups, there is a significant relation between a positive orientation and listening to others, and the link is stronger for the girls in both age groups (11–12-year-olds:  $z = -1.76$ ,  $p = .038$ ; 12–13-year-olds:  $z = -1.103$ ,  $p = .030$ ). However, the correlation values for the younger and older boys ( $z = -.224$ ,  $p = .422$ ) and the younger and older girls ( $z = -.223$ ,  $p = .412$ ) are not significantly different. A negative orientation is correlated with avoidance (WCQ) in both age groups, but there is no significant difference between the boys and girls within the age groups (11–12-year-olds:  $z = -.323$ ,  $p = .234$ ; 12–13-year-olds:  $z = -.101$ ,  $p = .298$ ), nor when comparing the two age groups by sex (boys:  $z = -.552$ ,  $p = .265$ ; girls:  $z = -.484$ ,  $p = .323$ ). A negative orientation is negatively related to confrontation for the boys and girls among the older students, and the correlation is stronger for the girls ( $z = -.171$ ,  $p = .044$ ).

Rationality is more closely associated with planned problem-solving and self-control for boys in both age groups (11–12-year-olds:  $z = 1.391$ ,  $p = .281$ ; 12–13-year-olds:  $z = .267$ ,  $p = .102$ ); however, the correlation values obtained for older and younger boys ( $z = -.301$ ,  $p = .388$ ) and girls ( $z = .302$ ,  $p = .380$ ) are not significantly different. Rationality is more strongly related to expressing own needs, thoughts and feelings for girls in both age groups (11–12-year-olds:  $z = .330$ ,  $p = .371$ ; 12–13-year-olds:  $z = .401$ ,  $p = .341$ ), but the correlation values for the older and younger boys ( $z = -.383$ ,  $p = .376$ ) and girls ( $z = -.266$ ,  $p = .397$ ) are not different. Rationality is also related to listening to others in both age groups (11–12-year-olds:  $z = -1.910$ ,  $p = .029$ ; 12–13-year-olds:  $z = -1.810$ ,  $p = .036$ ), but there is no difference in the strength of the correlation between boys' and girls' scores within or between age groups (boys:  $z = -.982$ ,  $p = .162$ ; girls:  $z = -.882$ ,  $p = .188$ ).

Impulsivity is only negatively correlated with confrontation for girls among the younger students, and for both sexes among the older students, but there is no significant difference between the boys and girls ( $z = -1.010$ ,  $p = .141$ ). There is a significant difference in the correlation between the younger and older girls. That is, the correlation is stronger for the older girls ( $z = -1.652$ ,  $p = .040$ ).

Among the younger students, avoidance (SPSI – R) is positively related to avoidance (WCQ) for the boys and negatively related to confrontation for the girls. For the older students, it is positively related to avoidance and negatively related to listening to others

**Table 4.** Relation (*r*, *p*) between SPSI – R, AQ and WCQ based on sex (10–11-year-olds, *n* = 182); below: boys, above: girls.

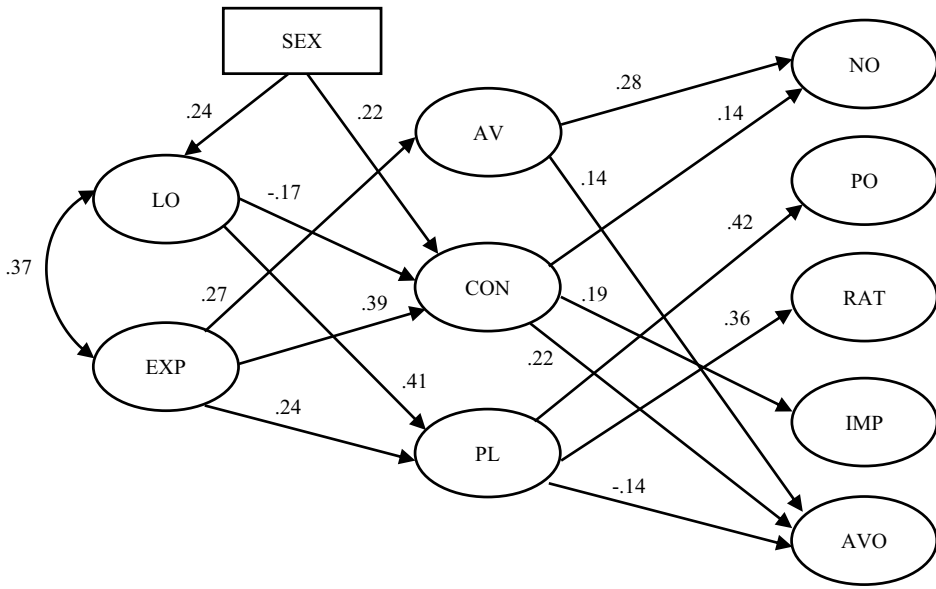
Factor	EXP	LO	PO	NO	RAT	IMP	AVO	PR	PL	DIS	AV	CON	WI	SS
EXP	–	.301 (.063)	.223 (.340)	.035 (.135)	<b>.567</b> (.001)	.043 (.861)	–.294 (0.17)	.025 (.950)	.331 (.061)	–.131 (.599)	.081 (.735)	–.073 (.781)	–.221 (.363)	.110 (.660)
LO	.083 (.863)	–	<b>.530</b> (.002)	.345 (.149)	<b>.437</b> (.002)	.155 (.525)	–.142 (.563)	.397 (.053)	.472 (.053)	.166 (.497)	–.166 (.496)	.126 (.606)	.211 (.387)	.491 (.038)
PO	.491 (.260)	<b>.311</b> (.011)	–	–.047 (.847)	.281 (.243)	–.057 (.816)	.007 (.976)	.229 (.345)	<b>.487</b> (.001)	.226 (.352)	–.134 (.583)	.064 (.794)	.009 (.971)	.101 (.690)
NO	–.431 (.331)	.514 (.238)	–.205 (.660)	–	.217 (.387)	.003 (.991)	.174 (.491)	.325 (.188)	.265 (.288)	–.238 (.341)	<b>.249</b> (.020)	.137 (.587)	.094 (.710)	.251 (.331)
RAT	<b>.362</b> (.007)	<b>.435</b> (.003)	.699 (.081)	–.201 (.665)	–	–.039 (.874)	–.366 (.123)	.211 (.385)	<b>.417</b> (.005)	–.131 (.592)	–.216 (.375)	.029 (.906)	.044 (.858)	.427 (.077)
IMP	.492 (.324)	.341 (.398)	.351 (.495)	.423 (.403)	.603 (.205)	–	.390 (.053)	–.018 (.941)	–.117 (.633)	.128 (.600)	–.272 (.260)	<b>–.340</b> (.002)	.103 (.676)	–.331 (.180)
AVO	–.700 (.079)	<b>–.430</b> (.028)	–.711 (.073)	.225 (.627)	–.406 (.367)	–.264 (.614)	–	.397 (.093)	–.301 (.210)	.213 (.381)	–.108 (.661)	<b>–.255</b> (.032)	.278 (.125)	–.048 (.849)
PR	.622 (.135)	.576 (.176)	.123 (.623)	.129 (.783)	.728 (.063)	.796 (.058)	–.690 (.087)	–	.432 (.065)	.300 (.212)	–.003 (.992)	.446 (.056)	.459 (.047)	.442 (.040)
PL	.383 (.541)	.339 (.457)	<b>.552</b> (.002)	–.237 (.608)	<b>.558</b> (.002)	.658 (.155)	–.622 (.135)	.797 (.002)	–	–.129 (.598)	.205 (.401)	.432 (.065)	.361 (.129)	.551 (.018)
DIS	.393 (.382)	.610 (.146)	.675 (.092)	–.055 (.906)	.639 (.122)	.733 (.097)	.190 (.683)	.319 (.485)	.238 (.608)	–	–.531 (.018)	–.206 (.397)	–.164 (.502)	.112 (.659)
AV	–.503 (.252)	.297 (.518)	.144 (.757)	<b>.222</b> (.031)	–.253 (.584)	–.119 (.822)	<b>.442</b> (.001)	–.095 (.840)	–.125 (.789)	–.462 (.297)	–	.298 (.216)	.332 (.165)	.002 (.994)
CON	.672 (.143)	.496 (.316)	.335 (.516)	.165 (.754)	.812 (.059)	.718 (.108)	–.595 (.213)	.700 (.121)	.388 (.447)	.716 (.109)	–.536 (.273)	–	.691 (.011)	.397 (.102)
WI	–.765 (.079)	.196 (.710)	–.218 (.678)	.155 (.769)	–.418 (.410)	–.211 (.734)	.733 (.097)	–.399 (.433)	–.281 (.590)	–.118 (.824)	.512 (.299)	–.812 (.095)	–	.315 (.203)
SS	.354 (.502)	.214 (.684)	.300 (.563)	.338 (.512)	.405 (.426)	.274 (.655)	–.443 (.379)	.398 (.434)	.046 (.931)	–.030 (.955)	.186 (.725)	.645 (.240)	–.706 (.117)	–

EXP = Expressing own needs, thoughts and feelings, LO = Listening to others; PO = Positive orientation, NO = Negative orientation, RAT = Rationality, IMP = Impulsivity, AVO = Avoidance; PR = Positive reappraisal, PL = Planned problem-solving and self-control, DIS = Distancing-acceptance, AV = Avoidance, CON = Confrontation, WI = Withdrawal – loss of control and asking for help, SS = Social support seeking. Bonferroni correction:  $p < .004$ .

for both sexes. In the older age group, the correlation between avoidance (SPSI – R) and avoidance (WCQ) is stronger for the boys ( $z = -2.691$ ,  $p = .004$ ). The relationship between avoidance and listening to others is also stronger for the boys ( $z = -1.623$ ,  $p = .048$ ) in the older age group.

SEM was used to describe the system of connections between the factors and theoretical model of the effects the variables have on one another (Figure 1). The factors included in the model were those that showed a significant relationship based on correlation analysis (see Tables 4 and 5). The analysis was performed on the whole sample as the size of the subsamples by sex is small for analysis.

The fitness of the theoretical model is satisfactory (whole sample):  $\chi^2 = 54.36$ ,  $p < .001$ ,  $df = 21$ ,  $\chi^2/df = 2.58$ , CFI = .95, TLI = .90, RMSEA = .07, SRMR = .04. The interaction of the two factors measuring communication (EXP, LO) was identified. Expressing own needs, thoughts and feelings (EXP) has a positive effect on the three coping strategies in the model: avoidance (AV), confrontation (CON), and planned problem-solving and self-control (PL). Listening to others (LO) has a negative effect on confrontation (CON) and a positive effect on planned problem-solving and self-control (PL). Avoidance (AV) as coping strategy has a positive effect on negative orientation (NO) and avoidance (AVO) as problem-solving style. Confrontation (CON) has a positive effect on negative orientation (NO), impulsivity (IMP), and avoidance (AVO). Problem-solving and self-control (PL) has a positive impact on positive orientation (PO), rationality (RAT), and a negative impact on avoidance (AVO). Sex has a positive effect on two measured factors, listening to others (LO) and confrontation (CON).



**Figure 1.** Results of SEM ( $N = 378$ ). LO = Listening to others; EXP = Expressing own needs, thoughts and feelings; AV = Avoidance (coping strategy); CON = Confrontation (coping strategy); PL = Planned problem-solving and self-control (coping strategy); NO = Negative orientation; PO = Positive orientation; RAT = Rationality; IMP = Impulsivity; AVO = Avoidance.

**Table 5.** Relation ( $r$ ,  $p$ ) between SPSP – R, AQ and WCQ based on sex (12–13-year-olds,  $n = 196$ ); below: boys, above: girls.

Factor	EXP	LO	PO	NO	RAT	IMP	AVO	PR	PL	DIS	AV	CON	WI	SS
EXP	–	.448 (.001)	.320 (.062)	.065 (.655)	<b>.578</b> (.001)	.097 (.505)	–.092 (.522)	.310 (.075)	.408 (.004)	.244 (.088)	.064 (.668)	–.112 (.439)	.181 (.219)	.267 (.067)
LO	.056 (.676)	–	<b>.543</b> (.001)	–.081 (.580)	<b>.523</b> (.001)	.180 (.215)	<b>–.240</b> (.002)	.326 (.075)	.290 (.061)	.226 (.115)	–.043 (.771)	<b>–.545</b> (.002)	.127 (.388)	.290 (.061)
PO	.125 (.356)	<b>.345</b> (.001)	–	–.122 (.392)	.707 (.000)	.221 (.120)	–.336 (.014)	.245 (.092)	<b>.570</b> (.002)	.124 (.390)	.182 (.215)	–.017 (.908)	–.088 (.553)	.215 (.143)
NO	.006 (.168)	.153 (.256)	–.215 (.101)	–	–.075 (.603)	.074 (.611)	.334 (.016)	.142 (.347)	.166 (.270)	.069 (.640)	<b>.352</b> (.032)	.213 (.146)	.178 (.199)	.296 (.053)
RAT	<b>.375</b> (.001)	<b>.567</b> (.001)	.230 (.059)	–.299 (.055)	–	.045 (.751)	.226 (.115)	.318 (.060)	<b>.478</b> (.001)	.299 (.052)	.085 (.570)	–.163 (.268)	.104 (.488)	.282 (.052)
IMP	.186 (.160)	–.065 (.633)	–.140 (.009)	.420 (.001)	–.163 (.206)	–	.059 (.682)	.399 (.055)	.253 (.086)	.080 (.590)	.010 (.947)	–.147 (.318)	.011 (.941)	.380 (.057)
AVO	.161 (.231)	<b>–.438</b> (.033)	–.240 (.070)	.586 (.001)	–.160 (.217)	.593 (.001)	–	–.211 (.150)	–.254 (.081)	.148 (.306)	<b>.334</b> (.002)	.262 (.066)	.225 (.124)	.085 (.567)
PR	.121 (.316)	.126 (.301)	.201 (.053)	.225 (.099)	.408 (.056)	.071 (.608)	.147 (.290)	–	.610 (.000)	.426 (.003)	.232 (.112)	–.310 (.034)	.239 (.106)	.525 (.000)
PL	.278 (.037)	.136 (.318)	<b>.665</b> (.001)	.037 (.785)	<b>.612</b> (.001)	–.043 (.748)	.080 (.558)	.280 (.037)	–	.453 (.001)	.065 (.663)	–.269 (.068)	.208 (.160)	.420 (.004)
DIS	.125 (.355)	.217 (.109)	.215 (.118)	.110 (.415)	.163 (.221)	.191 (.154)	.261 (.052)	.138 (.312)	.142 (.291)	–	.027 (.857)	–.070 (.634)	.411 (.004)	.460 (.001)
AV	.120 (.371)	.242 (.070)	–.001 (.996)	<b>.330</b> (.012)	.079 (.552)	.163 (.075)	<b>.610</b> (.002)	.185 (.172)	.251 (.057)	.085 (.523)	–	.074 (.623)	.196 (.186)	.310 (.034)
CON	.144 (.281)	.131 (.330)	–.038 (.781)	<b>–.310</b> (.001)	.033 (.804)	<b>–.313</b> (.003)	.233 (.082)	.232 (.086)	–.021 (.875)	.296 (.024)	.261 (.056)	–	.097 (.517)	–.008 (.959)
WI	.187 (.167)	.223 (.109)	.256 (.118)	.117 (.415)	.161 (.221)	.184 (.174)	.124 (.167)	.324 (.016)	.346 (.009)	.305 (.021)	.419 (.001)	.224 (.094)	–	.470 (.001)
SS	.191 (.061)	.092 (.542)	.067 (.630)	.303 (.101)	.056 (.683)	.252 (.049)	.153 (.170)	.387 (.004)	.247 (.072)	.302 (.025)	.434 (.001)	.473 (.001)	.443 (.001)	–

see Table 4.

## Discussion

The aim of the study is to explore the characteristics of SPS, coping strategies and assertive communication and their relations among 10–11- and 12–13-year-olds, focusing on differences between boys and girls. We chose these ages because a significant change in problem-solving can be identified at 12–13 years of age, which implies a change in other factors (Author, 2014). We considered it important to examine sex characteristics because research shows that they are often more strongly associated with a range of background variables and other personality characteristics than age (Webster-Stratton, 2011). Identification of sex differences is a priority before designing a development programme (Zsolnai, 2013).

As hypothesized, 10–11-year-olds have a more positive attitude and belief in the problem solution, while 12–13-year-olds have a negative orientation, impulsivity and avoidance. In contrast to previous research, there is no age difference in rationality. There are many reasons for this, such as the composition of the sample, with several studies having linked such an age difference to cognitive abilities, such as inductive reasoning (Author, 2015; Chang et al., 2004). Also in line with the hypothesis, girls in both age groups make decisions in a problem-focused way (rational style), while boys are more avoidant. For impulsivity, only the younger boys scored higher, with no difference identified for the 12–13-year-olds. There is no sex difference in a positive or negative orientation in either age group.

The older students scored higher on positive reappraisal, avoidance, confrontation, and planned problem-solving and self-control, with the girls scoring higher on confrontation in both age groups and only the older girls scoring higher on planned problem-solving and self-control and only the older boys scoring higher on avoidance. According to this research, confrontation has a strong rational basis among girls and is not associated (or to a lesser extent) with impulsivity and significant negative attitudes. Although these relations have been shown in other research (Eschenbeck et al., 2007; Williams & McGillicuddy De Lisi, 1999), we were unable to identify them in this study, which may be due to the complexity of measuring coping strategies with factors. The SPSI – R measure suggests that boys are more avoidant, which is confirmed by their lower value for confrontation as a coping strategy. The data also confirm that boys are more avoidant in both age groups but not more impulsive. Avoidance is associated with less frequent expression of one's own needs, thoughts and feelings (which also reduces the possibility of confrontation) and lower levels of listening to others (Gaumer Erickson et al., 2018).

Contrary to the hypothesis, older students scored higher on average in both areas of assertive communication. There is no difference between girls and boys in expressing their own needs, feelings and thoughts at either age, but girls are the ones who listen more often to the other party in both age groups, in which perspective taking as part of empathy plays an important role, which many studies have shown is more developed in girls and can better help them make appropriate decisions in problematic situations (Adani & Cepanec, 2019). Indeed, Ilie and Metea (2015) argue that assertive communication requires a significant degree of listening to the other person, considering perspective when necessary, which is an important component of empathy.

The lack of a sex difference in expressing own feelings and thoughts contrasts what is mainly explained by neurobiological and language developmental differences. Expressing own needs, thoughts and feelings is more characteristic of girls, suggesting a sex difference in a feeling of self-efficacy and indicating that girls express their intentions more openly and explicitly (Adani & Cepanec, 2019). Similarly, expressing own needs, feelings and thoughts is more strongly correlated with rational style in girls in both age groups in this study.

Based on the model developed by T. J. D'Zurilla and Nezu (2007), it can be seen that coping strategies are well-matched to the relation between problem orientations and problem-solving styles on the SPSI – R and that the communication areas measured are strongly linked to the SPSI – R factors and coping strategies that facilitate effective communication (Eschenbeck et al., 2007). A negative orientation and avoidance (SPSI – R) are positively correlated with avoidance (WCQ) in both age groups, but the relation between avoidance (SPSI – R) and avoidance (WCQ) is

only stronger among boys aged 12–13. A positive orientation and rationality are usually closely related to planned problem-solving and self-control and the two areas of communication. Listening to others is linked to a positive orientation as an attitude, and expressing emotions and thoughts is linked to rationality, both of which are more typical of girls at both ages. However, both rationality and a positive orientation are more strongly associated with planned problem-solving and self-control among boys in both age groups. In the case of this factor, thoughtful decision-making, which is implied by rationality and which the data suggest is more characteristic of girls, is also very important for boys. Therefore, although the data show that rationality is more typical of girls, it cannot be argued that boys are less focused on the facts in a problematic situation. However, it does raise the question of what communication tools they use when they do.

The direct effects (SEM) confirm the relationships obtained from the correlation analysis based on sex. The results of SEM computed on the whole sample confirm not only the correlations measured on sex groups, but also the regression and correlation results of previous research (Pipas & Jaradat, 2010). The present study clearly shows that the listening to others playing a role in coping by plan, but a negative effect on confrontation. The expression of one's own emotions and thoughts has an impact on each of the coping strategies (in the model), whether they are avoidant, confrontational or based on significant deliberation and planning. It is no coincidence that correlation analysis suggests that these coping strategies are closely related to the measured SPSI – R factors. This is also confirmed by the pattern revealed by SEM, which corroborates what T. J. D'Zurilla and Nezu (2007) have reported on the relationship between problem solving and coping. The avoidance strategy affects avoidant problem-solving style and the generally associated negative orientation. Confrontation also affects these and impulsivity, which highlights a possible negative feature of confrontation: by exacerbating negative emotions, a non-adaptive form of behaviour may emerge. The planned problem-solving coping strategy is also related to positive orientation, rationality and avoidance, all three being affected. Planned (rational) problem-solving and avoidance highlight a very rare relationship that has already been explored in previous research (Author, 2015).

Related to this is the research finding that a negative orientation-rationality-avoidance triad is identified in 10–15% of adolescent boys (Author et al., 2018). A negative orientation is not always dysfunctional and not always associated with impulsivity, but it may have (or the individual hopes for) positive consequences in certain situations, which may have a significant self-protective function. This finding highlights the need to examine not only the process of problem-solving style and coping strategies, but also who it is associated with and what the goal is. To examine this, person-specific questionnaires (e.g. think about your problems with your peers) and story-based measures (e.g. think about the person you are thinking about) are probably more appropriate than general questionnaires (with no specific person to think about for each statement). Correlational studies have shown that the results of analysing a phenomenon with a questionnaire can provide a more nuanced picture of the functioning of the factor measured in an analysis of relations, thus pointing to previously strongly dominant but incorrect conclusions.

## Limitations

In the present study, the instrument used did not allow for a direct exploration of the characteristics of submissive, aggressive and passive-aggressive communication styles or to identify their relations with problem-solving attitudes, styles and coping strategies, which is certainly needed in the future. In the future, it will be important to investigate the relations between the domains that have been measured on a larger sample – allowing more sophisticated and stable analysis by subsample – and in a longitudinal study. It is also important that in the future, in addition to self-report, parents and teachers likewise assess students in these areas in order to reveal the influence of parental and teacher patterns on children's behaviour. In addition to these variables, it is worthwhile to include other contextual variables (e.g. school and family climate, financial background), only some of which were included in the study (e.g. number of siblings) and will be worth further analysis.

## Conclusion

The results of the present study suggest that there is a presumed change between the ages of 10–11 and 12–13 in the social problem-solving, coping strategies and assertive communication and in the relations between them, i.e. a sensitive period for these domains. However, the results also show that in some domains, the characteristics of 12–13-year-olds can be identified as early as 10–11 years. Based on the results of SEM, assertive communication plays an important role in the functioning of some coping strategies, which has an impact on social problem-solving process. Our results are consistent with those of previous studies in a number of areas but also highlight features that have not been addressed in this area. These differences between boys and girls in the first instance call for a rethink of school interventions. These characteristics confirm that the development of certain characteristics in a development programme can be supported by different methodological tools for girls and boys.

## Biographical note

*Anett Balogh-Pécsi* is German and drama teacher and PhD student of the University of Szeged Doctoral School of Education (Hungary). Her research interests include the social-emotional development of adolescents. She is a member of the Hungarian Academy of Sciences – University of Szeged School Failure Prevention Research Group (Hungary).

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## Disclosure statement

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

## Funding

László Kasik had a project (Research Programme for Public Education Development: Hungarian Academy of Sciences – University of Szeged School Failure Prevention Research Group, Hungary). The research was supported by the ICT and Societal Challenges Competence Centre of the Humanities and Social Sciences Cluster of the Centre of Excellence for Interdisciplinary Research, Development and Innovation of the University of Szeged. László Kasik is member of the New Tools and Techniques for Assessing Students Research Group.

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## Compliance with ethical standards

The work has not been published previously and is not under consideration for publication elsewhere. The submitted paper includes the results of our research. *Data sharing not applicable.*

## Ethical aspects

The research was approved by the United Ethics Review Committee for Psychological Research (ethics approval number 2017/125). Principal and parental permission was obtained to collect the data, and the students gave written consent to participate. Data collection was anonymous.

## Informed consent

The manuscript has been seen and reviewed by all authors, and the authors declare that they are the authors of this study. Participants have been informed about the research, and we have parental permits: all children's parents allowed pedagogical evaluation and they have also verified their participation in the study and the evaluation their children with their signature (based on Hungarian Ethical Norms for Psychologist).

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