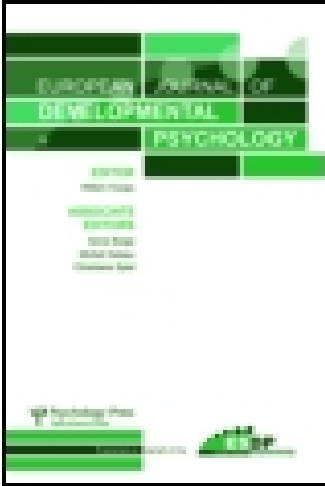


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Development of social problem solving— A longitudinal study (2009–2011) in a Hungarian context

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The aims of the longitudinal study were to investigate the development of social problem solving (SPS) among adolescents ($N = 180$) in Hungary, to describe the nature of correlations between the raters' judgements (child, mother, teacher) and to examine what the correlations are between SPS factors and family background. At the beginning of the study students were 12-year-olds and they were 14 at the last time of measurement. The questionnaire of SPS was adapted [SPSI-R:S, D'Zurilla, T. J., Nezu, A., & Maydeu-Olivares, A. (2002). *Social Problem-Solving Inventory-Revised (SPSI-R): Technical manual*. North Tonawanda, NY: Multi-Health Systems]. The factors were the following: negative and positive problem orientation (NPO, PPO, respectively), rational problem solving (RPS), impulsivity/carelessness style (ICS) and avoidance style (AS). Based on self-assessment, NPO, RPS, ICS and ACS show increasing tendency with age; however, in the case of PPO, significant age differences have not been found. The mothers' ratings are the same in the case of NPO, PPO and RPS, but they think that their 12-year-olds show lower impulsivity and avoidance than their children of 13 and 14 years. According to the teachers' rating, NPO, RPS and AS show increasing tendency; however, the values of ICS and PPO decrease with age. Correlations between children's and mothers' ratings are strongest, and the most divergent evaluations were given by teachers and mothers. Parents' educational levels influence the SPS factors differently: mothers' educational level has an effect on NPO and ICS; fathers' educational level has an impact on RPS in all years. The effects of

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free-time activities in family are stronger than those of the time spent learning with children in all years.

Keywords: Adolescent; Social problem solving; Longitudinal study.

INTRODUCTION

International studies agree that social problem solving (SPS) has a profound influence on success in personal life, on mental health (Elliott, Bush, & Chen, 2006), on academic achievement (e.g., Rodríguez-Fornells & Maydeu-Olivares, 2000), and, in turn, on the functioning of different social groups and society as a whole (e.g., Lindsay et al., 2011). Several studies have pointed out that mental health and school success also have an impact on SPS (McMurran & McGuire, 2005).

SPS is a widely researched area of social functioning which gave rise to a number of theoretical frameworks (McMurran & McGuire, 2005). The theoretical framework used in the present study is a model developed by D’Zurilla and Goldfried (1971) and D’Zurilla and Nezu (1990). D’Zurilla, Nezu, and Maydeu-Olivares (2004) define SPS as 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), SPS includes five different factors: positive and negative problem orientation (NPO), rational problem solving (RPS), impulsivity/carelessness style (ICS) and avoidance. The Social Problem Solving Inventory-Revised (SPSI-R; D’Zurilla, Nezu, and Maydeu-Olivares, 2002), one of the most widely accepted instruments in SPS assessment, measures these five factors.

These factors are significantly related to age (Chang, D’Zurilla, & Sanna, 2004; D’Zurilla et al., 2002). The efficiency of SPS increases from young adulthood through midlife and then shows a decreasing tendency (D’Zurilla, Maydeu-Olivares, & Kant, 1998). Middle-aged adults scored higher on the dimension of positive problem orientation (PPO) and RPS and scored lower on the dimension of NPO (D’Zurilla et al., 2004). Folkman, Lazarus, Pimley, and Novacek (1987) found that older individuals use a less problem-focused coping style than younger individuals. Hampel and Petermann (2005) reported no significant differences in the use of problem-focused strategies between 8- and 14-year-olds. In a previous cross-sectional study of ours, we analysed the functioning of the five SPS factors among 12- and 14-year-olds (Kasik, 2009). The raters were the children themselves, their mothers and their teachers. Based on the self-assessment and the mothers’ evaluation, PPO and rationality were higher among 14-year-olds than among 12-year-olds. When all raters’ evaluations were considered, the NPO was found to be higher among 14-year-olds than among 12-year-olds. According to the evaluations of children and teachers, impulsivity was higher among 14-year-olds

than among 12-year-olds. Finally, on the basis of teachers' evaluations alone, avoidance appeared to be higher among 14-year-olds than among 12-year-olds.

Longitudinal studies involving adult participants suggest that NPO predicts future anxiety and stress (Ciarrochi & Scott, 2006). According to Ciarrochi, Leeson, and Heaven (2009), this pattern is also seen in adolescence: adolescents strongly characterized by PPO were shown to exhibit positive emotions and empathy more frequently. Furthermore, PPO also appears related to better family quality of life (e.g., fewer parent–adolescent conflicts). This latter effect, in turn, has a positive influence on relationships with peers and on SPS at school. D'Zurilla and Nezu (1990) proposed that RPS improves the social behaviour of both children and adults, but this is still a matter of debate. The findings of Shure (1999) seem to suggest this proposition, although there is also evidence to suggest the opposite. In a study by Cooper (2011), early adolescents were found to exhibit RPS and a high level of aggression at the same time.

Evidence suggests that contextual variables also have a significant influence on the development of SPS. Family structure and one's position within that structure during childhood and adolescence might be the most important factors to influence problem-solving behaviour (Grusec & Davidov, 2007). The studies of Pakaslahti, Karjalainen, and Keltikangas-Järvinen (2002) and Keltikangas-Järvinen (2005) point out that the development of SPS is also strongly determined by the interactions within the family (e.g., between parents and children, between child and child), and by mothers' and by fathers' problem-solving strategies as models. Perez et al. (1981) found that children with family problems were less effective in terms of SPS in a school environment. Parenting techniques (influenced by the education received), and the parents' behaviour during family free-time activities and during learning with their children can also have a significant effect (e.g., Hofferth & Sandberg, 2001). A number of studies (Jesson, Turbin, & Costa, 1998) reported higher levels of problem behaviour among adolescents of less advantaged demographic backgrounds.

When interpreting these results, however, we have to take cultural differences into consideration. There are well-described differences between Western and Eastern cultures, for instance, in optimism and pessimism (Chang, 2001). A review of the literature on Hungary suggests that Hungarians tend to be very pessimistic regarding their future and self-efficacy in interpersonal relationships. In fact, a considerable proportion of Hungarian males (10–15%) were seen to suffer from chronic stress, with symptoms of exhaustion and depression, often accompanied by pessimism and a confrontational attitude toward the world around them (Kopp, Skrabski, Réthelyi, Kawachi, & Adler, 2004).

RESEARCH PROBLEMS, AIMS AND HYPOTHESES

As stated earlier, we already conducted a cross-sectional study on this subject (Kasik, 2009), with results similar to those of other national studies, without data

to assess development. We thus decided to repeat the same study, 1 and 2 years later (2010 and 2011), involving those children of the 2009 sample who had been 12 years old at that time. This strategy permitted analysis of development.

Three specific aims and related hypotheses were formulated. The major aim of the study was the longitudinal assessment of SPS development between the ages 12 and 14 years. Based on our cross-sectional study and on the existing literature, we hypothesized that all five SPS factors would show significant, continuous and positive change with age. As a sub-hypothesis, we also assumed that the raters' judgements would not overlap: children's and mothers' evaluations would show more similarity than children's and teachers' or teachers' and mothers' evaluations, in both study years. The background of this assumption was the observation that the correlation between children's self-reports and those of external raters is low until prepuberty, even if it increases later (e.g., Renk & Phares, 2004).

We also examined the relationship between SPS factors and a number of family characteristics. The second hypothesis stated that these family characteristics would have a moderate effect on the SPS factors, and that the effect of family characteristics would remain similar throughout the period examined. Previous studies (e.g., D'Zurilla et al., 2002) revealed that the SPS factors are in a significant (positive or negative) correlation with each other. The third aim was to assess how these inner correlations change in the examined period. The third hypothesis stated that the changes would be similar to those found in other national studies.

METHODS

Participants

The cross-sectional study was carried out in 2009 in 6 schools and 16 school classes in Hungary ($N = 185$, female: 48%, male: 52%). The 12-year-old subsample of this measurement formed the basis of the first and second longitudinal phases. The longitudinal phases consisted of two sub-phases which took place in 2010 ($N_{13\text{-YEAR-OLDS}} = 183$) and in 2011 ($N_{14\text{-YEAR-OLDS}} = 180$). The ratio of sexes (female:male) was 47%:53% (2010) and 49%:51% (2011), respectively. This phase involved the same students who had been 12 years old in 2009, except for three students who changed schools in the meantime. In all other respects, the conditions were the same as in 2009. The number of mothers involved was the same as that of children. The number of participating teachers was 16 (one per class, all women). The native language of all participants was Hungarian.

Raters

The judgements of three raters were used (child, mother, teacher) based on the well-known observation that teachers are prone to overemphasize children's negative characteristics, whereas parents overestimate their children's positive qualities

(Webster-Stratton & Lindsay, 1999). Thus, because parent and teacher evaluations are affected by partiality and its distorting effect, it is best to use both teacher and parent rating besides children's own ratings to balance biases (Coie, 1990).

Instruments

SPSI-R:S. The SPS questionnaire was adapted from D'Zurilla et al. (2002). The original was first translated to Hungarian, the resulting Hungarian version then back translated, with the Hungarian version finalized only after clarifying all potentially problematic words or phrases.

We used the short version of SPSI-R (*SPSI-R:S*), which assesses the five factors of SPS: PPO, NPO, RPS, ICS and avoidance style (AS). All factors include five items (resulting in total 25 items). PPO covers elements of constructive problem solving, such as self-efficacy and positive outcome expectancy. NPO covers a set of dysfunctional cognitive-emotional schemas like low self-efficacy and negative outcome expectancy. RPS can be defined as a constructive problem-solving style that is characterized by rational, deliberate and systematic application of effective problem-solving skills. ICS is a set of dysfunctional problem-solving attempts like impulsivity and carelessness. AS is a dysfunctional dimension characterized by passivity and attempts to shift the responsibility of problem solving to others.

Mother and teacher versions were transformed from the children's version (in first person singular), by reformulating the items in third person singular. The *SPSI-R:S* subscales consist of 5-point (from 0 to 4) Likert-type items where: 0, not at all true of me; 1, slightly true of me; 2, moderately true of me; 3, very true of me; 4, extremely true of me.

All versions of the Hungarian adaptation showed adequate reliability (Cronbach's α) and validity [Kaiser–Meyer–Olkin (KMO) index] at all studied ages. In the case of the cross-sectional phase, the Cronbach's α s were above .71 and the KMO indexes were above .82. In the case of the longitudinal phase, the Cronbach's α s were above .72 and the KMO indexes were above .82.

Considering that the biases necessitate judgements of the different raters being analysed together, an integrated index [cumulative index (CI)] was generated from the individual judgements for each item (by averaging the three individual scores), and this was used to characterize development. Nevertheless, the analysis of individual judgements may still be necessary.

Family background. To analyse characteristics of family background, we used our own instrument (Family Background Questionnaire [FBQ]—Kasik, 2009). This questionnaire includes six factors: (1) family type (FT), (2) mother's educational level (MEL), (3) father's educational level (FEL), (4) net income (NI), (5) free-time activities in family (FTA), (6) time spent on learning with children (TSL).

Mothers specified FT in the first part of the questionnaire in their own words. Based on their responses, a following system of categories was developed: **1**, mother and father with one child; **2**, mother and father with two or more children; **3**, mother with one child; **4**, mother with two or more children; **5**, father with one child; **6**, father with two or more children; **7**, grandparent/s with child/ren; **8**, other adult/s with child/ren and **9**, child with older brother or older sister. The categories of MEL and FEL are as follows: **1**, elementary school; **2**, vocational school; **3**, high school; **4**, college or university. The NI section includes predefined categories regarding the financial circumstances of the family, defined as NI per capita per month (based on the valid Hungarian income system in 2009 and 2011; mothers presented the definitions of these categories as an appendix of the questionnaire). The categories are as follows: **1**, very poor; **2**, poor; **3**, average; **4**, good; **5**, excellent. FTA assesses the amount of time spent on free time activities (e.g., playing, watching TV or going to cinema) with children in a week: **1**, less than 1 h; **2**, 1–2 h; **3**, 2–3 h; **4**, 3–4 hours and **5**, more than 4 h. The TSL categories are the same as the FTA categories.

Data collection

In all phases, students filled in the SPSI-R:S at school in the classroom. Teachers and mothers completed the questionnaire during parent-teacher conferences in the school. The mothers filled in the FBQ during parent-teacher conferences only in 2009 and in 2011. Fathers were also asked to fill in the questionnaire in 2009, but only a few fathers did so (8%). Consequently, we analysed only mothers' responses. Informed consent was obtained from all participants (in the case of children, consent was obtained from parents).

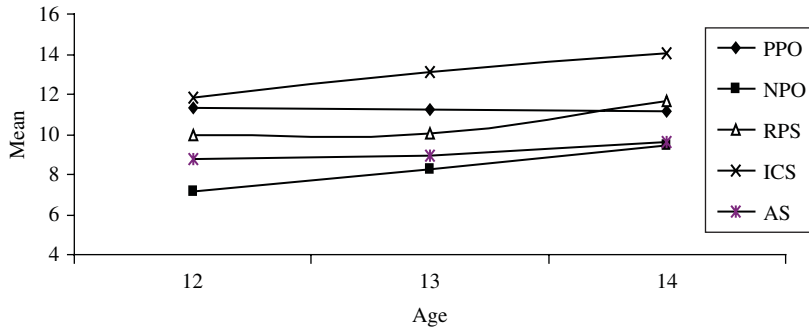
Statistical analysis

For the longitudinal analyses, ANOVA (with post-hoc Bonferroni test) was used. In order to reveal the relation of the background variables to the factors, regression analysis was used. The distribution of the background variables was determined with the χ^2 test. To determine how raters' judgements relate to the factors, Pearson's r was computed, completed with a z -test to check the generalizability of the strength differences between the correlations.

RESULTS

Age-related changes of SPS

Age-related changes in the cumulative index of SPS are shown in [Figure 1](#). This figure also includes the values of SPS factors based on the 3 years of the study.



Factor	12 (2009, N=185)	13 (2010, N=183)	14 (2011, N=180)	Age-related changes
PPO	11.32 (1.75)	11.26 (1.11)	11.12 (1.29)	12 = 13 = 14
NPO	7.15 (1.18)	8.26 (1.20)	9.42 (1.78)	12 = 13 → 14
RPS	9.93 (1.29)	10.05 (1.45)	11.66 (1.60)	12 = 13 → 14
ICS	11.86 (1.31)	13.08 (1.87)	14.05 (1.54)	12 → 13 → 14
AS	8.76 (1.86)	8.94 (1.55)	9.63 (1.67)	12 = 13 → 14

Figure 1. Age-related changes of SPS between the ages of 12 and 14 (based on the cumulative index, based on ANOVA and post hoc Bonferroni test). PPO, positive problem orientation; NPO, negative problem orientation; RPS, rational problem solving; ICS, impulsivity/carelessness style; AS, avoidance style. →, change; =, no change.

On the basis of the cumulative index (CI), in the case of all five factors, ANOVA and post hoc Bonferroni tests were used to determine mean differences between the three age groups (RPS: 12/13: $p > .05$; 13/14: $p < .05$; 12/14: $p < .05$; AS: 12/13: $p > .05$; 13/14: $p < .05$; 12/14: $p < .05$; NPO: 12/13: $p > .05$; 13/14: $p < .05$; 12/14: $p < .05$; ICS: 12/13: $p < .05$; 13/14: $p < .05$; 12/14: $p < .05$; PPO: 12/13: $p > .05$; 13/14: $p > .05$; 12/14: $p > .05$). In the cases of RPS, NPO and AS, significant differences were found only between the ages 12 and 14 (12 = 13 → 14; RPS: $F = 12.21$ $p = .04$; NPO: $F = 13.57$ $p = .02$; AS: $F = 11.06$ $p = .04$), that is, data recorded at the ages 12 and 13 do not differ significantly. ICS showed a continuously increasing tendency with age (12 → 13 → 14; ICS: $F = 12.67$ $p = .03$). No significant change was observed in PPO (12 = 13 = 14; $F = 5.01$ $p = .26$), which means that PPO remained unchanged throughout the studied period.

As hypothesized, children's and adults' assessments of the SPS factors turned out to be different. The results of self-assessment (Table 1) indicated an increasing tendency with age in four factors (NPO, RPS, AS: 12 = 13 < 14; ICS: 12 < 13 < 14), but in the case of PPO, the values are similar (12 = 13 = 14). The mothers' ratings (Table 2) remained almost the same across the studied ages in the case of NPO and PPO (12 = 13 = 14), but they indicated an increasing tendency with age in the cases of ICS, RPS and AS (12 < 13 < 14). According

TABLE 1
Age-related changes of SPS between the ages of 12 and 14 (based on the self-assessment, ANOVA and post hoc Bonferroni test)

<i>Factor</i>	<i>12 (2009, N = 185)</i>	<i>13 (2010, N = 183)</i>	<i>14 (2011, N = 180)</i>	<i>Age-related changes</i>
PPO	11.24 (1.66)	11.20 (1.07)	11.51 (1.09)	12 = 13 = 14
NPO	7.05 (1.10)	8.03 (1.22)	9.50 (1.55)	12 = 13 → 14
RPS	10.01 (1.22)	9.80 (1.78)	10.87 (1.67)	12 = 13 → 14
ICS	11.45 (1.20)	12.60 (1.76)	13.51 (1.21)	12 → 13 → 14
AS	8.41 (1.51)	8.38 (1.32)	9.41 (1.45)	12 = 13 → 14

TABLE 2
Age-related changes of SPS between the ages of 12 and 14 (based on the mothers' evaluations, ANOVA and post hoc Bonferroni test)

<i>Factor</i>	<i>12 (2009, N = 185)</i>	<i>13 (2010, N = 183)</i>	<i>14 (2011, N = 180)</i>	<i>Age-related changes</i>
PPO	12.06 (1.55)	11.42 (1.15)	11.41 (1.20)	12 = 13 = 14
NPO	7.25 (1.13)	8.31 (1.17)	9.18 (1.67)	12 = 13 = 14
RPS	9.63 (1.11)	10.12 (1.20)	11.65 (1.57)	12 → 13 → 14
ICS	11.24 (1.12)	13.45 (1.66)	14.51 (1.19)	12 → 13 → 14
AS	8.95 (1.49)	9.30 (1.40)	9.79 (1.08)	12 → 13 → 14

to teachers (Table 3), NPO, RPS and AS increase with age (12 < 13 < 14), whereas ICS and PPO are the highest among 12-year-olds and are similar in the last 2 years (12 < 13 = 14).

Correlations between raters' judgements

The correlations between raters' judgements are shown in Table 4. Based on the *z*-test for the comparison of correlations' differences, the correlations between the raters are different. In line with the hypothesis, the relationship between

TABLE 3
Age-related changes of SPS between the ages of 12 and 14 (based on the teachers' evaluations, ANOVA and post hoc Bonferroni test)

<i>Factor</i>	<i>12 (2009, N = 185)</i>	<i>13 (2010, N = 183)</i>	<i>14 (2011, N = 180)</i>	<i>Age-related changes</i>
PPO	10.52 (1.70)	11.01 (1.02)	10.41 (1.18)	12 → 13 = 14
NPO	7.30 (1.10)	8.41 (1.27)	9.62 (1.71)	12 → 13 → 14
RPS	10.19 (1.24)	10.98 (1.33)	11.98 (1.47)	12 → 13 → 14
ICS	12.50 (1.40)	13.45 (1.30)	14.11 (1.60)	12 → 13 = 14
AS	9.01 (1.86)	9.59 (1.71)	9.95 (1.19)	12 → 13 → 14

TABLE 4
Pearson correlations among the raters' judgements

Raters	12 (2009, N = 185)				13 (2010, N = 183)				14 (2011, N = 180)						
	PPO	NPO	RPS	ICS	AS	PPO	NPO	RPS	ICS	AS	PPO	NPO	RPS	ICS	AS
(1) Child-mother	.48	.32	.41	.42	.32	.59	.39	.42	.45	.44	.56	.46	.29	.42	.29
(2) Child-teacher	.28	.24	.23	.21	.22	.32	.29	.22	.22	.33	.29	.40	.21	.34	.41
(3) Mother-teacher	.21	.22	.15	.20	.26	.25	.35	.23	.33	.20	.18	.21	.41	.24	.18

Notes: PPO, positive problem orientation; NPO, negative problem orientation; RPS, rational problem solving; ICS, impulsivity/carelessness style; AS, avoidance style. All correlations are statistically significant ($p < .05$).

children's and mothers' responses is strongest in most cases, and the largest divergence is observed between teachers' and parents' responses. The results of the z -tests [$\text{age}_{\text{FACTOR}}$ (raters—see Table 4), z and p values—only significant differences are given]: $12_{\text{PPO}}(1-2) z = 2.04 p = .04$; $12_{\text{PPO}}(1-3) z = 2.69 p = .00$; $12_{\text{RPS}}(1-3) z = 2.47 p = .01$; $12_{\text{ICS}}(1-2) z = 2.04 p = .04$; $12_{\text{ICS}}(1-3) z = 2.13 p = .03$; $13_{\text{PPO}}(1-2) z = 2.11 p = .03$; $13_{\text{PPO}}(1-3) z = 3.73 p = .00$; $13_{\text{ICS}}(1-2) z = 2.24 p = .02$; $13_{\text{AS}}(1-3) z = 2.41 p = .01$; $14_{\text{PPO}}(1-2) z = 3.81 p = .00$; $14_{\text{PPO}}(1-3) z = 3.94 p = .00$; $14_{\text{NPO}}(1-3) z = 3.69 p = .00$; $14_{\text{NPO}}(2-3) z = 2.04 p = .04$.

Correlations of SPS factors

Tables 5–7 show the results of the inter-correlation analysis, by rater and age (only 12 and 14 years). The correlations between the SPS factors are significant ($p < .05$ or $.01$). The values between PPO–RPS, ICS–AS, NPO–AS and ICS–NPO are positive, regardless of rater, and negative between PPO–NPO, PPO–ICS, PPO–AS, RPS–NPO, RPS–AS and ICS–RPS, also regardless of rater.

The input (12 years) and output (14 years) measurements were compared. The self-assessment indicated significant differences between the correlation of NPO–ACS ($z = 2.54 p = .03$), NPO–PPO ($z = 3.41 p = .02$), AS–ICS ($z = 3.84 p = .00$) and PPO–RPS ($z = 2.2.66 p = .01$). In the case of the mothers, the correlation values are statistically significant among correlation of NPO–PPO ($z = 3.77 p = .00$), NPO–RPS ($z = 2.56 p = .02$), PPO–ICS ($z = 3.65 p = .00$) and AS–RPS ($z = 2.17 p = .03$). Based on the teachers' assessment, the correlation are statistically significant among correlation of NPO–RPS ($z = 2.29 p = .02$), NPO–ICS ($z = 3.09 p = .00$) and NPO–AS ($z = 2.58 p = .02$).

TABLE 5
Results of Pearson correlation analysis—rater: *child* (lower half: 12-year-olds, $N = 185$, upper half: 14-year-olds, $N = 180$)

	<i>PPO</i>	<i>NPO</i>	<i>RPS</i>	<i>ICS</i>	<i>AS</i>
<i>PPO</i>		-.54**	.36**	-.30*	-.33*
<i>NPO</i>	-.44*		-.24*	.25*	.52**
<i>RPS</i>	.46*	-.22*		-.41**	-.32*
<i>ICS</i>	-.24*	.24*	-.37**		.48**
<i>AS</i>	-.36**	.32**	-.28*	.41**	

Notes: PPO, positive problem orientation; NPO, negative problem orientation; RPS, rational problem solving; ICS, impulsivity/carelessness style; AS, avoidance style.

* $p < .05$; ** $p < .01$.

TABLE 6
Results of Pearson correlation analysis—rater: *mother* (lower half: 12-year-olds,
 $N = 185$, upper half: 14-year-olds, $N = 180$)

	<i>PPO</i>	<i>NPO</i>	<i>RPS</i>	<i>ICS</i>	<i>AS</i>
<i>PPO</i>		-.55**	.40**	-.31*	-.35**
<i>NPO</i>	-.42*		-.28*	.23*	.47*
<i>RPS</i>	.39*	-.19*		-.40*	-.32*
<i>ICS</i>	-.22*	.21*	-.38*		.44**
<i>AS</i>	-.32**	.40*	-.22*	.38**	

Notes: *PPO*, positive problem orientation; *NPO*, negative problem orientation; *RPS*, rational problem solving; *ICS*, impulsivity/carelessness style; *AS*, avoidance style.

* $p < .05$; ** $p < .01$.

Family background

The distribution of FT categories was found to be similar in both studied years ($\chi^2 = 6.14$ $p = .74$). The first category (mother and father with child) represented the largest percentage of FTs (42–53%). The aggregate distribution of the first, second (17–22%, mother and father with two or more children) and third (10–18%, mother with one child) categories added up to approximately 80%.

The distribution of MEL and FEL were the same in 2009 and 2011 (mothers: $\chi^2 = 9.11$ $p = .79$; fathers: $\chi^2 = 6.45$ $p = .84$). Among the mothers, those with college or university education were over-represented, whereas among the fathers, high school education was dominant in 2009 ($\chi^2 = 55.45$ $p = .04$) and in 2011 ($\chi^2 = 48.48$ $p = .04$).

The distribution of NI categories was similar in the 2 studied years (2009 and 2011) ($\chi^2 = 10.22$ $p = .68$). The third category (average) represented the largest

TABLE 7
Results of Pearson correlation analysis—rater: *teacher* (lower half: 12-year-olds,
 $N = 185$, upper half: 14-year-olds, $N = 180$)

	<i>PPO</i>	<i>NPO</i>	<i>RPS</i>	<i>ICS</i>	<i>AS</i>
<i>PPO</i>		-.46**	.42*	-.31*	-.48**
<i>NPO</i>	-.46**		-.24*	.22*	.44**
<i>RPS</i>	.40*	-.30*		-.39*	-.30*
<i>ICS</i>	-.28*	.14*	-.45**		.41**
<i>AS</i>	-.45**	.29*	-.28*	.42**	

Notes: *PPO*, positive problem orientation; *NPO*, negative problem orientation; *RPS*, rational problem solving; *ICS*, impulsivity/carelessness style; *AS*, avoidance style.

* $p < .05$; ** $p < .01$.

percentage (44–50%), and the aggregate distribution of the third and first (15–18%, very bad) and second (12–15%, wrong) categories added up to approximately 75% in both major study phases.

The distributions of FTA categories turned out to be significantly different in the two (2009 and 2011) phases ($\chi^2 = 39.54$ $p = .03$). The explanation of this difference lies in the finding that among the 12-year-olds (2009) the aggregate distribution of the first, second and third categories (up to 3 h a day) was 70%, while in the case of the 14-year-olds (2011) the mentioned categories added up to 85% of the entire distribution. In other words, time spent on shared FTA decreases with age.

In the case of TSL, among the 12-year-olds, the proportions of categories 1–2 (less than 1 h, 1–2 h in a week) and 4–5 (3–4 h, more than 4 h in a week) were found to be exactly the same (25%, 25%). By 2011, the distributions of the same categories significantly changed (1–2: 44%, 4–5: 16%; $\chi^2 = 25.09$ $p = .02$).

Relationship between SPS and FB

The relationship between SPS factors and the characteristics of FB was examined using regression analysis. The dependent variables were the SPS factors and the independent variables were FT, MEL, FEL, NI, FTA and TSL. It was analysed how well the independent variables predicted the dependent ones. First, all dependent and independent variables were included. This resulted in low goodness-of-fit ($GFI < .63$). Further analysis was conducted to find those independent variables that yielded the best fit. This analysis revealed that FT, TSL and NI deteriorated model fit, while MEL, FEL and FTA enhanced it ($GFI > .86$), regardless of which SPS factor was studied. Therefore, MEL, FEL and FTA were included in the final analysis.

Tables 8 and 9 show the results of the final analysis. Among the 14-year-old children, the explained variances are lower than among the 12-year-olds, except for RPS, which is higher at the age of 14 ($R_{12}^2 = .16$, $R_{14}^2 = .19$). Among the 12-year-olds (2009), the explained variances are similar, except for NPO, where the explained variance is higher ($R_{12}^2 = .23$). The values of NPO and RPS are the highest ($R_{NPO}^2 = .20$, $R_{RPS}^2 = .19$) among the 14-year-olds (2011). Regardless of age, MEL always has a greater influence on all studied SPS factors than FEL, the only exception being RPS, where FEL appears to be the more influential.

DISCUSSION

The results of our study concur with the results of Hungarian and international studies in the same domain. The results extend our knowledge about social functioning in adolescence, and are intended to be used as the basis for a development programme in 2013/2014.

TABLE 8
The impact of the family background (independent) variables on the SPS factors
(dependent variables): 12-year-olds in 2009, $N = 185$

Independent variables	SPS factors				
	PPO	NPO	RPS	ICS	AS
MEL	.064	.096	.051	.061	.060
FEL	.041	.067	.075	.031	.032
FTA	.068	.072	.034	.073	.091
Explained variance (R^2)	.17	.23	.16	.17	.18

Notes: PPO, positive problem orientation; NPO, negative problem orientation; RPS, rational problem solving; ICS, impulsivity/carelessness style; AS, avoidance style. MEL, mother's educational level; FEL, father's educational level; FTA, free time activities in family; in all cases $p < .05$. The values are the products of B (unstandardized estimates) and β (standardized estimates).

According to Anderson (2000), the differences between the raters' judgements have considerable influence on the effectiveness of development programmes in schools. In the present study, the correlations between raters' judgements varied by the SPS factors. The relationship between children's and mothers' responses was strongest in most cases, whereas teachers' and mothers' responses were the most divergent. The results, therefore, confirmed our hypothesis which also corresponds to the findings of earlier Hungarian studies (e.g., Zsolnai & Kasik, 2011). We assume that this phenomenon is typical during the school years. Nevertheless, it needs to be noted that the respondents were mothers, and as observed by several studies, mothers' opinions about social behaviour and thinking are different from those of fathers (Grusec & Davidov, 2007). It is also an open question if mothers and teachers based their judgement on at least similar social situations. A person- and situation-specific study is in progress to explore this further.

TABLE 9
The impact of the family background (independent) variables on the SPS factors
(dependent variables): 14-year-olds in 2011, $N = 180$

Independent variables	SPS factors				
	PPO	NPO	RPS	ICS	AS
MEL	.052	.076	.041	.054	.041
FEL	.047	.063	.058	.034	.031
FTA	.059	.066	.029	.032	.057
Explained variance (R^2)	.15	.20	.19	.12	.13

Notes: PPO, positive problem orientation; NPO, negative problem orientation; RPS, rational problem solving; ICS, impulsivity/carelessness style; AS, avoidance style. MEL, mother's educational level; FEL, father's educational level; FTA, free time activities in family; in all cases $p < .05$. The values are the products of B (unstandardized estimates) and β (standardized estimates).

As hypothesized, children's and adults' assessments of the SPS factors turned out to be different. Based on the cumulative index, 14-year-olds demonstrate a greater tendency to define problems, to make conscious decisions before actually solving them, to interpret problems in multiple perspectives, and to take more potential solutions into consideration. It is also the 14-year-olds who typically interpret having to solve problematic social situations as a negative phenomenon. Furthermore, children belonging to this cohort tend to base their decisions and realizations on emotions more frequently than members of the other studied cohorts. Problem avoidance and postponement of solutions are more characteristic of 13- and 14-year-olds than younger children. Our cross-sectional results (Kasik, 2009) are similar to the results of this study, and it might be argued that data from the longitudinal phase confirm the cross-sectional results. Seen from another perspective, it may be said that the cross-sectional results are good predictors of the longitudinal results.

As hypothesized, the positive correlations are the highest between PPO–RPS and between ICS–AS. These correlations are positive, regardless of rater or age. In the cases of PPO–NPO, PPO–ICS, PPO–AS, RPS–NPO, RPS–AS and ICS–RPS, the correlations are negative (the most negative between PPO–NPO). The inner correlations of SPS are similar to those found by D'Zurilla et al. (2002), which raises the possibility that the internal correlations are culture-independent. Clearly this issue needs more exploration. The results confirmed our expectations, inasmuch as the correlations varied with age and the variance was different by rater. The results also confirm the view that three raters are necessary for a proper evaluation of social components when studying children.

The results of the regression analyses clearly support those of other studies (Grusec & Davidov, 2007), and illustrate the importance of family characteristics when designing social developmental programmes. The problem-solving patterns of parents, which we examined only in an indirect way, may also play a significant role. Parental patterns, in turn, depend on various family variables, such as family structure, parents' educational level and family activities.

Parents' highest level of education has an indirect effect that influences parents' educational techniques, which, in turn, have an impact on children's social behaviour. As shown in Hungarian studies (e.g., Zsolnai & Kasik, 2011), mothers' education has a low but still significant effect on the SPS factors. In contrast to earlier Hungarian data, we found that FEL also has a significant impact on the SPS factors, but this effect is similarly low. In addition, parents' educational levels influence SPS factors differently: mothers' education has an effect on NPO and ICS, whereas fathers' education has an impact on RPS in all groups. Castan, Gallois, and Callan (1985) obtained similar results in connection with MEL. This, however, is not to say that the functioning of SPS is a direct function of the parents' educational level. It is more likely that the level of education determines the parents' repertoire of interpersonal problem-solving behaviours, which children observe and internalize.

Our results suggest that the family background has the greatest influence on NPO. As a negative view of the future and low self-reported efficacy in frustrated

situations are characteristic of the Hungarian adult population in general (Kopp et al., 2004), these results might indicate the appearance of the parental model in children's SPS. It has been suggested that family activity has a vital influence on children's thinking and behaviour (Grusec & Davidov, 2007) as during shared free-time activities and when learning with children, parents may indirectly teach a variety of social patterns to their children. In the present study, the time that parents spend with children performing free-time activities decreases with age.

Several environmental, personality-related and psychological factors can influence SPS. In this study, however, we concentrated on family, as our long-term goal is to construct a developmental programme that approaches SPS development through the family. Not only will family background be observed, but also parents will be involved in both the planning and implementation of the programme. Apart from this, it would be worth exploring the connections between SPS and various cognitive functions, such as inductive reasoning, which is also a good proxy of general intelligence (Csapó, 1997) or theory of mind.

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