

MEASURING PERCEIVED SOCIAL SUPPORT IN ROMANIAN ADOLESCENTS: PSYCHOMETRIC PROPERTIES OF THE MULTIDIMENSIONAL SCALE OF PERCEIVED SOCIAL SUPPORT

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Abstract

The Multidimensional Scale of Perceived Social Support (MSPSS) is a measure widely used in the studies carried out in various fields of applied psychology. This study aims to evaluate the psychometric properties of the Romanian version of the Multidimensional Scale of Perceived Social Support (MSPSS). To assess the factorial structure and validity of MSPSS (Study 1), 556 Romanian adolescents completed the MSPSS together with measures of overall life satisfaction, satisfaction with family, probability of engaging in risk behaviors, negative affective disposition, and suicidal risk. The factorial structure was counter-validated in a second sample of 702 adolescents (Study 2). In a third study, 149 adolescents completed the MSPSS twice, to estimate test-retest reliability. The data resulted from the exploratory factor analysis indicated three factors that accounted for 73.67% of the total item variance. Comparative analysis of four hypothetical measurement models showed the superiority of the three-factor model. Multi-group data analysis revealed the invariance of the factorial model across adolescent's gender and age. In the three samples, the internal consistencies of the MSPSS subscales were found to be high (Cronbach's $\alpha = .86-.91$). The values of test-retest reliability were: Family = .79, Friends = .78, Significant other = .78, and total MSPSS = .78. Also, evidence for the concurrent and construct (discriminant) validity is presented. Girls reported higher levels of all types of social support as well as total support. Compared with adolescents living in disintegrated families, those from intact families reported higher levels of social support from their families. The MSPSS is a valid and reliable short measure that can be administered to explore the perceived social support from family, friends, or significant other among adolescents.

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1. Introduction

The current study focuses on MSPSS (Zimet et al., 1988) which is one of the most widely used measures of perceived social support. The MSPSS was initially developed in English to address the subjective assessment of social support availability and adequacy from three specific sources: family, friends, and significant other. It has been tested on different age groups and across different cultural backgrounds and found to be a reliable and valid measure of perceived social support (Bruwer et al., 2008; Canty-Mitchell & Zimet, 2000; Chou, 2000; Clara et al., 2003; Eker & Arkar, 1995; Ramaswamy, Aroian & Templin, 2009). The MSPSS has well-established psychometric properties with community samples of adolescents (Bruwer et al., 2008; Canty-Mitchell & Zimet, 2000; Cheng & Chan, 2004; Chou, 2000; Edwards, 2004; Ramaswamy, Aroian & Templin, 2009; Zimet et al., 1990), clinical samples of adolescents diagnosed with psychiatric disorders (Kazarian & McCabe, 1991), samples of college students (Dahlem et al., 1991; Duru, 2007; Eker & Arkar, 1995; Zimet et al., 1988), samples of healthy adults (Rizwan & Aftab, 2009; Stanley et al., 1998; Zimet et al., 1990) as well as samples of adults diagnosed with psychiatric disorders (Clara et al., 2003; Stanley, Beck & Zebb, 1998). The original English version of the MSPSS was used in ethnically diverse samples of adolescents living in the USA, such as Mexicans (Edwards, 2004), Arabs (Ramaswamy, Aroian & Templin, 2009), or African-Americans (Canty-Mitchell & Zimet, 2000). Cheng and Chan (2004), and Chou (2000) published two studies where MSPSS was administered to adolescents who had been socialized within a different cultural context than the American one and were speaking a language other than English.

The psychometric studies conducted among adolescents have used either the exploratory factor analysis (Canty-Mitchell & Zimet, 2000; Edwards, 2004) or the confirmatory factor analysis (Bruwer et al., 2008; Cheng & Chan, 2004; Ramaswamy, Aroian & Templin, 2009). Hence, almost all studies have confirmed the factorial structure which was originally reported by Zimet and his colleagues (1988). One study reported invariance across the age and gender of the MSPSS measurement model (Cheng & Chan, 2004). The three-factor structure was confirmed among students (Dahlem et al., 1991; Duru, 2007). In the adolescent population, several studies (Bruwer et al., 2008; Canty-Mitchell & Zimet, 2000; Cheng & Chang, 2004; Edwards, 2004; Kazarian & McCabe, 1991; Ramaswamy, Aroian & Templin, 2009) have reported internal consistencies for the three subscales ranging from .63-.91 (Family), .75-.92 (Friends), .61-.91

(Significant Other), and .77-.93 (total MSPSS). The studies on the psychometric properties of MSPSS in the adolescent population demonstrated evidence of convergent validity (Chou, 2000; Edwards, 2004; Kazarian & McCabe, 1991), discriminant validity for subscale Family (Canty-Mitchell & Zimet, 2000; Edwards, 2004; Ramaswamy, Aroian & Templin, 2009), and construct validity (Bruwer et al., 2008; Chou, 2000; Zimet et al., 1990).

For the social and cultural context in Romania, a study assessing the factorial validity, construct validity, criterion-related validity, and reliability of the Romanian version of MSPSS was published (Marian, 2007). This study was based on a heterogeneous sample of 379 youths and adults, with a mean age of 33.57 years. Exploratory factor analysis data indicated a well-differentiated three-factor structure (i.e., social support from family, friends, and significant other). Together, these factors accounted for 76.2% of the total MSPSS item variance. Also, good values of internal consistency (α ranging from .83 to .92) and test-retest reliability ($N = 261$, $r = .67-.80$; retest was performed at six weeks) have been reported. Construct validity was assessed by correlating the MSPSS subscales with the Beck Depression Inventory ($N = 65$ adults diagnosed with depression) and Life Orientation Test ($N = 40$ adults diagnosed with cancer). Also, high levels of perceived social support were associated with low levels of depression and a high level of dispositional optimism, respectively. However, even if it is meritorious, the study conducted by Marian (2007) did not aim to evaluate the psychometric properties of the Romanian version of the MSPSS in the population of Romanian adolescents.

2. The current studies

Up till today, no study that assesses the psychometric properties of MSPSS in the adolescent population living in Eastern Europe (including Romania) has been published. This paper summarizes the main findings of a series of three studies aimed at assessing the psychometric properties of the Romanian version of MSPSS which was administered to three community samples totaling 1407 Romanian adolescents. Thus, Study 1 aimed at evaluating the factorial validity of the Romanian version of MSPSS using exploratory factor analysis. A second objective was to estimate its discriminant and concurrent validity. Gender differences in the three sources of social support and total support were also examined. Based on confirmatory factor analysis in another sample of adolescents (Study 2), we intended to counter-validate the measurement model revealed in Study 1 and to test its invariance across gender and age. Another aim of this study is to obtain additional evidence for construct and concurrent validity.

Study 3 aimed to evaluate test-retest reliability and the internal consistency of the MSPSS subscales. The studies conducted to date in adolescent population have assessed only the internal consistency of MSPSS (Bruwer et al., 2008; Canty-Mitchell & Zimet, 2000; Cheng & Chan, 2004; Chou, 2000; Ramaswamy, Aroian & Templin, 2009; Zimet et al., 1990). Test-retest reliability has been reported by some studies that targeted young people/university students (Duru, 2007; Zimet et al., 1988) or adults without health-related problems (Rizwan & Aftab, 2009; Stanley, Beck & Zebb, 1998). Therefore, one of the contributions of Study 3 is the estimation of test-retest reliability of the subscales of MSPSS which was administered to a sample of Romanian adolescents.

3. Study 1

3.1. Participants and procedure

The MSPSS was administered together with other measures of 556 adolescents as part of a wider community study (unpublished) focused on the predictive factors for risk behaviors among adolescents. The recruitment pool included six secondary schools in the third largest town in Romania, which is located in the Northeastern region of the country. There were 354 girls and 196 boys (6 participants did not report their gender). The ages of participants ranged from 15 to 19 years ($M = 16.64$; $SD = 13.28$). All participants had a Romanian ethnic background. Most of them (90.1%) were Orthodox Christians, 4.3% were Catholics, and the remaining had other religious backgrounds. Three-quarters lived in intact families (with both parents, and in many cases, with brothers and/or sisters), while 24.2% lived in disintegrated families (e.g., the death of one parent or parental divorce). All protocols with responses were eligible and were entered into the database. Twenty of the participants had three or less missing responses to MSPSS or other simultaneously administered measures. In such cases, the missing values were replaced with the rounded value of the mean scores for the other items.

The study was approved by the Ethics Committee of the Department of Psychology, “Alexandru Ioan Cuza” University (Iasi, Romania). Before the collection of data, the parents or legal guardians of adolescents have signed an informed consent form. Responses were anonymous to ensure confidentiality. Participants were told they could choose not to answer the questionnaires. Hence, compliance with the task of completing the questionnaires was 98%. Participants were informed about the purpose of the study and the task they had to perform.

3.2. Measures

The participants in groups of 25-30 students completed a protocol that included 13 standardized questionnaires. In the present paper, only the scales used to estimate the construct validity and concurrent validity of MSPSS are presented.

Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988). As earlier stated, the original English version of MSPSS was initially developed for USA social and cultural contexts. It was translated from English to Romanian by the last author of the current paper. In this study, the participants completed the Romanian version of MSPSS. MSPSS measures the perceived availability and adequacy of social support from three sources: family (4 items), friends (4 items), and significant other (4 items). Participants responded to each item on a seven-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) with a neutral midpoint (*neither agree, nor disagree*). For each item, the score can range from 1 to 7, depending on the answer chosen by a participant. For each source of support, the score is obtained by averaging the score across all four items (possible range: 1-7).

Multidimensional Student's Life Satisfaction Scale-Family (MSLSS-F; Huebner, Laughlin & Gilman, 1998). The MSLSS is a 40-item self-report measure which composed of items designed to capture the level of satisfaction across five distinct domains, i.e. family, friends, living environment, school, and self. In our community study, only the subscale on family satisfaction was used. This includes seven items (e.g., "My family is better than the most") which were rated on a six-point Likert-type scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). An average score for the family satisfaction is obtained by averaging the score across all seven items (possible range: 1-6), with high scores indicating high levels of satisfaction with family. In the initial validation studies conducted on adolescents (Gilman, Huebner & Laughlin, 2000; Huebner, Laughlin & Gilman, 1998), the Family subscale showed good internal consistency ($\alpha > .75$). Factor analysis data showed that the Family subscale is well-differentiated from the other domains which are measured by MSLSS. In the current sample, the subscale on family satisfaction had high internal consistency ($\alpha = .88$).

Risk Behaviors Scale (RBS; Weber, Blais & Betz, 2002). Participants also completed the subscale Health/Safety of RBS. This measure includes 8 items (e.g., "Consuming five or more servings of alcohol over a single evening") to operationalize the likelihood of engaging in health/safe-related risk behaviors. Each item was responded to using a five-point Likert-type scale ranging from 1 (*very unlikely*) to 5 (*very likely*). A participants' total score was obtained by adding the item scores (possible range: 1-5). In one of the initial validation studies, Weber, Blais,

and Betz (2002) reported evidence for the unidimensionality of the subscale. Subsequently, the authors reported an acceptable internal consistency value ($\alpha = .77$). For the current sample of adolescents, $\alpha = .70$.

Suicidal Behaviors Questionnaire-Revised (SBQ-R; Osman et al., 2001). This brief instrument allows the assessment of suicidal risk with four items tapping: lifetime suicide ideation and suicide attempt (item 1), frequency of suicidal ideation over the past year (item 2), telling someone about suicide attempts or threats (item 3), and the likelihood of committing suicide in the future (item 4). For every item, participants had five, six, or seven possible answers. A total score can be calculated by summing the item scores (possible range 3-18). The SBQ-R was originally validated both in a sample of adolescents without mental disorders and in a clinical sample of adolescents diagnosed with various mental disorders. In these samples, the authors reported internal consistencies equal to .87 and .88, respectively. In our adolescent sample, the internal consistency of SBQ-R was very good ($\alpha = .89$).

3.3. Statistical analyses

Data analyses were performed using the SPSS software, Version 20.0 (IBM SPSS, Chicago, IL). The student's *t*-test for two independent samples was used to perform comparisons by the gender and status of the family-of-origin. For each comparison, the effect size was estimated using Cohen's *d* coefficient (Cohen, 1992). Both for the total sample and the girl and boy subsamples, discriminant validity was determined by comparing the correlation between Family MSPSS subscale and Family MSLSS subscale with the correlations between Friends and Significant Other MSPSS subscales and Family MSLSS subscale. A similar strategy has been used in other studies in adolescents (Canty-Mitchell & Zimet, 2000; Edwards, 2004). Also, the procedure outlined by Clark-Carter (2010) was used to test the difference between the two correlations obtained in the same sample.

To determine the factor structure of MSPSS, an exploratory factor analysis using principal components analysis with varimax rotation and Kaiser normalization was undertaken. To test the suitability of raw data for the reduction of items, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Kaiser, 1974) and Bartlett's test of sphericity (Dziuban & Shirkey, 1974) were used. Kaiser (1974) suggested that values between .70 and .80 are good, values between .80 and .90 are great, while values greater than .90 are excellent. Furthermore, factor analysis is suitable when Bartlett's test is statistically significant (Dziuban & Shirkey, 1974). An extracted factor was retained when its eigenvalue ≥ 1.00 .

3.4. Results

Factorial validity and reliability. The values of KMO and Bartlett’s tests were equal to .85 and 3719.50 ($p < .001$), respectively. Thus, it indicated the suitability of the raw data set for the exploratory factor analysis. This analysis yielded three factors with eigenvalues of 2.98, 2.96, and 2.88. The first factor (which is identified as perceived support from friends) accounted for 24.87% of the total item variance. The second factor (which is identified as perceived support from family) accounted for 24.73% of the total item variance. Finally, the third factor (which is identified as perceived support from a significant other) accounted for 24.06% of the total item variance. Table 1 summarizes the factor pattern, loadings of MSPSS items in the three factors yielded by the exploratory factor analysis, and the communalities.

The comparison of math anxiety levels according to the gender of pupils who participated in the study was performed using the *t*-Student test for two independent samples. The critical threshold for determining statistical significance was fixed at $p = 0.05$ (two-tailed).

Table 1. Factor pattern and communalities for MSPSS Items (Romanian version)

MSPSS items	Factors			Communalities
	<i>F1 (Friends)</i>	<i>F2 (Family)</i>	<i>F3 (Significant Other)</i>	
1	.11	.14	.84	.74
2	.16	.14	.85	.78
3	.05	.81	.16	.68
4	.12	.88	.13	.82
5	.18	.17	.80	.71
6	.83	.11	.15	.73
7	.85	.12	.16	.77
8	.14	.81	.08	.68
9	.83	.10	.13	.72
10	.13	.06	.79	.65
11	.08	.86	.12	.76
12	.85	.07	.13	.75

Note: The order number of each item is listed in the Appendix section. Values in boldface are loadings of the items on the original factors

Communalities ranged from .65 to .82 (mean = .73; median = .73). As expected, almost all MSPSS items showed loadings greater than .80 in the hypothetical latent factors. Simultaneously, item loadings in the other two factors were very low or negligible. For each of the subscales corresponding to the extracted factors, a score was computed as was described above. The correlations between subscales were from mild to moderate: Family with Friends = .43 ($p < .001$),

Family with Significant Other = .31 ($p < .001$), and Friends with Significant Other = .39 ($p < .001$).

For the subscales corresponding to the three factors, the internal consistencies (Cronbach's α) were very good: Family = .86, Friends = .88, Significant Other = .87. Also, for all MSPSS items, the internal consistency was equal to .86.

Concurrent and discriminant validity. Table 2 summarizes the linear correlations between MSPSS scores and the scores of the other measures. The family subscale score showed the most consistent associations with the scores based on the likelihood of engaging in risk behaviors and suicidal risk. All correlations were in the expected direction. Friends subscale showed negative associations, but they are more modest in strength, with risk behaviors and suicidal risk, respectively. Also, the total MSPSS score was negatively associated with the scores on risk behaviors and suicidal risk.

Table 2. Correlations between the MSPSS total and subscale scores, satisfaction with family, the likelihood of engaging in health/safe-related risk behaviors, and suicide risk (total sample)

MSPSS subscales	MSLSS-Family	RBS	SBQ-R
Family	.74 ***	-.18 ***	-.31 ***
Friends	.32 ***	-.14 **	-.15 ***
Significant Other	.23 ***	-.08	-.01
MSPSS total	.52 ***	-.16 ***	-.19 ***

Note: MSLSS-Family = Multidimensional Students' Life Satisfaction Scale-Family; RBS = Risk-Behaviors Scale; SBQ-R = Suicidal Behaviors Questionnaire-Revised.

* $p < .05$; ** $p < .01$; *** $p < .001$

For the total sample, the correlation between the MSLSS Family subscale and MSPSS Family subscale ($r = .74$; $p < .001$) was significantly stronger than the correlations with the MSPSS subscales Friends ($r = .32$; $p < .001$; $t = 12.70$; $p < .001$) and Significant Other ($r = .23$; $p < .001$; $t = 13.65$; $p < .001$). For girls, the correlation between the MSLSS subscale Family and MSPSS Family subscale ($r = .75$; $p < .001$) was significantly stronger ($t = 10.32$; $p < .001$) than the correlation with the Friends subscale ($r = .32$; $p < .001$). Also, the correlation between the MSLSS Family subscale and the MSPSS Family subscale was significantly stronger ($t = 12.42$; $p < .001$) than that with the subscale Significant Other ($r = .18$; $p < .001$). Similar results were obtained for boys. Thus, the correlation between the MSLSS Family subscale and MSPSS Family subscale ($r = .73$; $p < .001$) was significantly stronger ($t = 7.03$; $p < .001$) than the correlation with Friends subscale ($r = .35$; $p < .001$). Also, the correlation between the MSLSS Family subscale and the

MSPSS Family subscale was significantly stronger ($t = 6.70$; $p < .001$) than the correlation with the MSPSS Significant Other subscale ($r = .32$; $p < .001$).

Descriptive and comparative statistics. Given the possible range of the MSPSS scores, the adolescents who participated in the first study reported moderate to high levels of perceived social support from family, friends, and significant other (Table 3). Compared to boys, girls reported higher levels of social support from friends ($t = 3.01$; $p < .01$) and significant other ($t = 5.35$; $p < .001$). They also displayed a greater total social support ($t = 4.30$; $p < .001$). For the support from friends, the effect size was small ($d = .27$), whereas for the support from the significant other and overall support, the effect sizes were moderate ($d = .51$ and $d = .40$, respectively).

Table 3. Subscale means and standard deviations for the total sample, girls, and boys

MSPSS subscales	Total sample (N = 556)		Girls (N = 353)		Boys (N = 196)		t-Student
	M	SD	M	SD	M	SD	
Family	5.67	1.23	5.71	1.28	5.60	1.13	1.05
Friends	5.29	1.25	5.42	1.21	5.09	1.28	3.01 **
Significant Other	5.78	1.28	6.01	1.12	5.38	1.42	5.35 ***
MSPSS total	5.54	.96	5.68	.89	5.31	1.02	4.30 ***

Note: ** $p < .01$; *** $p < .001$

There was no significant difference in the score for perceived support from family ($t = .004$; $p > .05$) found between adolescents living in intact families ($M = 5.65$; $SD = 1.23$) and those living in temporarily or permanently disintegrated families ($M = 5.65$; $SD = 1.26$).

4. Study 2

4.1. Participants and procedure

The sample for the second study was obtained by combining two samples used in two separate studies (unpublished). The first sample included 457 adolescents who responded to MSPSS, Mental Health Inventory-5 (Berwick et al., 1991), and Perceived Stress Scale (Cohen, Kamarck & Mermelstein, 1983). Thus, this was in the context of a study aimed at testing the moderating effect played by social support in the relationship between perceived stress and well-being. There were 284 girls and 173 boys, aged between 14 and 19 years ($M = 16.73$; $SD = 1.25$). The second sample included 245 adolescents (130 girls and 115 boys) who completed the MSPSS, Mental Health Inventory-5, and Satisfaction with Life Scale (Diener et al., 1985) as part of a study that explored the predictors of subjective well-being among adolescents. The mean age was 16.40 (SD

= 1.36; range 14-19 years). Thus, data on factorial validity, measurement invariance across gender and age, as well as effects of gender and age were based on the responses of 702 adolescents (414 girls and 288 boys) to the MSPSS.

The study was approved by the Ethics Committee of the Department of Psychology, “Alexandru Ioan Cuza” University (Iasi, Romania). Participants were recruited from five public high schools. In obtaining consent from participants, a similar procedure to that used in Study 1 has been pursued. Participants were informed about the goals of the study and the tasks they had to perform. To increase the validity of responses, the questionnaires were completed anonymously.

4.2. Measures

Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988). For the operationalization of perceived social support, participants completed the Romanian version of the MSPSS (see Study 1). For the entire sample, the internal consistency of subscales was: Family = .90, Friends = .90, Significant Other = .87, and total MSPSS = .91.

Mental Health Inventory-5 (MHI-5; Berwick et al., 1991). In both studies mentioned in the Participants section, emotional well-being was measured with MHI-5 which is a five-item screening instrument (e.g., “How much of the time during the past month, have you felt calm and peaceful?”). The respondent is asked to assess his/her emotional well-being by choosing one of the five answers distributed on a five-point Likert-type scale, i.e. from 0 (*none of the time*) to 5 (*all of the time*). The total score was obtained by summing the score across all items (possible range: 0-25). Marques and his collaborators (2011) have reported evidence for the reliability and validity of MHI-5 which they administered to a sample of Portuguese adolescents without medical or psychiatric problems. A value of .82 for internal consistency has been reported. Data on exploratory factor analysis indicated the unidimensionality of the scale. In the current study, the internal consistency was satisfactory ($\alpha = .78$).

Satisfaction with Life Scale (SWLS; Diener et al., 1985). This widely used instrument consists of five items (e.g., “If I could live my life over, I would change almost nothing”) with a seven-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The total score was obtained by summing the item scores (possible range: 5-35). Also, there is strong evidence of factorial validity, construct validity, and reliability of the SWLS, including the population of adolescents (Diener et al., 1985; Neto, 1993). Based on a sample of university undergraduates, the authors reported a unidimensional factorial structure, with a very good internal consistency ($\alpha =$

.87) and test-retest reliability of .82 (Diener et al. 1985). In our study, $\alpha = .92$.

Perceived Stress Scale (PSS; Cohen, Kamarck & Mermelstein, 1983). This measure was designed to capture the degree to which real-life situations experienced by a person are perceived to be stressful. PSS has been tested psychometrically mostly using samples of college students and adults (Lee, 2012). The instrument consists of 14 items (e.g., “In the last month, how often have you been upset because of something that happened unexpectedly?”) with responses given on a Likert-type scale with five verbal anchors, i.e. from 0 (*never*) to 5 (*very often*). For each participant, the total score was calculated by summing the items (possible range: 0-56). In two samples of college students and a sample of adults, the authors reported values of internal consistency ranging from .84 to .86, and test-retest reliability of .85 (Cohen, Kamarck & Mermelstein, 1983). PSS has been shown to have criterion-related validity (e.g., positive correlation with the number of stressful life events, score for the impact of stressful events, and severity of physical and depressive symptoms). In the present study, internal consistency was satisfactory ($\alpha = .79$).

4.3. Statistical analyses

Data were processed with SPSS software, Version 20.0 (IBM SPSS, Chicago, IL) and AMOS, Version 20.0 (Arbuckle, 2011). The missing data were treated using a similar strategy as that used in Study 1. Using confirmatory factor analysis, four hypothetical measurement models were investigated and compared to each other. They include: a) a one-factor model in which scores in MSPSS items were hypothesized to indicate a single latent construct (i.e., perceived social support); b) a model with first-order three-factors (i.e., perceived support from family, friends, and significant other) which were allowed to correlate freely between them (within this model, scores on the items meant to capture each dimension of social support were introduced as indicators for the corresponding latent factors); c) a model with first-order two-factors (i.e., support from family and significant other vs. support from friends) as suggested by Stanley, Beck, and Zebb (1998) and d) a second model with first-order two-factors (i.e., support from friends and significant other vs. support from family) proposed by Chou (2000).

To estimate non-standardized and standardized parameters of each measurement model, maximum likelihood (ML) procedure based on variance-covariance matrix input was used. The Structural Equation Modeling (SEM) with ML procedure assumes that observed variables have normal distributions (Byrne, 2010). In the present data set, the univariate normality of the distribution for each observed variable (i.e., item score) was evaluated by examining values of *skewness* and *kurtosis*. Absolute values of *skewness* ranged from .59 to 1.06 (mean = .81; median

= .82). For *kurtosis*, absolute values ranged from .01 to .79 (mean = .27; median = .18). In the current data set, only for items 1 and 2, the value of *skewness* was problematic. The multivariate *kurtosis* (Mardia's coefficient) was equal to 125.36 and was significantly different from zero (CR = 90.6; $p < .001$). One approach to handle the presence of non-normal observed variables in SEM suggests the use of a bootstrapping procedure which yields more accurate ML estimates of parameters (Byrne, 2010). Therefore, estimates for the four hypothetical measurement models of MSPSS ($k = 500$ samples) were obtained by applying the bootstrapping procedure (method based on bias-corrected confidence intervals) which is available in AMOS and corrects for biases in parameter estimates.

The statistical adequacy of all measurement models was estimated using the following criteria: χ^2 (Fisher's chi-square exact test), degree of freedom (df) and significance level (p), SRMR (standardized root mean square residual), CFI (comparative fit index), and RMSEA (root mean square error of approximation). A non-significant value for χ^2 , a value higher than .95 for CFI, a value as close as possible to zero for SRMR, and a value lower than .05 for RMSEA are thought to indicate an excellent model fit. Thus, following the suggestion from literature, we considered a value of RMSEA as high as .08 to indicate an acceptable fitting of SEM models (Byrne, 2010). As a supplementary criterion of model selection, Akaike's Information Criterion (AIC) was applied. This indicator is used in the comparison of two or more SEM models, with smaller values representing a better fit of the hypothesized model (Byrne, 2010).

To test invariance across the gender and age of the factorial model retained for the MSPSS, two multi-group analyses were performed. For the test of invariance, we used the difference between the χ^2 value calculated for the configural model (with no equality constraints imposed) and the χ^2 value calculated for the model whereby loadings in latent factors were constrained to be equal across gender/age (Byrne, 2010). When the $\Delta\chi^2$ value was not statistically significant, the factorial model was considered to be invariant.

To estimate the effects of gender and age, a 2x2 MANOVA test was performed using MSPSS scores as the dependent variables. Pillai's F was used as a multivariate test. Comparisons for MSPSS Family subscale depending on the status of family-of-origin were performed with One-Way ANOVA. *Post-hoc* comparisons with Bonferroni correction were performed. For all significant differences, the effect size estimate was based on Cohen's d coefficient.

4.4. Results

Confirmatory factor analysis. Out of the four factorial models tested, the model with three correlated factors yielded the best fit indices with SRMR < .08, CFI > .95, RMSEA < .08, and AIC having the lowest value (Table 4). Since χ^2 statistic is sensitive to the sample size, the requirement of nonsignificant χ^2 value was relaxed when the adequacy of the retained factorial model to input data was analyzed.

Table 4. Goodness-of-fit indices for factorial models of the MSPSS

Models	χ^2	<i>df</i>	SRMR	CFI	RMSEA	90% CI for RMSEA	AIC
One-factor	2120.31 ***	54	.128	.640	.234	.225-.242	2168.31
Three-factors intercorrelated (FA, FR, SO)	214.47 ***	51	.037	.972	.068	.058-.077	268.47
Two-factors (FA & SO vs. FR)	1166.68 ***	53	.115	.806	.173	.165-.182	1216.68
Two-factors (FR & SO vs. FA)	1006.38 ***	53	.095	.834	.160	.152-.169	1056.38

Note: FA = Family, FR = Friends, SO = Significant Other. *** $p < .001$

Bootstrapped standardized estimates of factor loadings (Figure 1) ranged from .76 to .90 (mean = .82). Thus, they were all statistically significant ($p < .001$). Absolute biases (i.e., difference between bootstrapped mean estimates and estimates for the original data set) ranged from .0001 to .006 (mean = .002) which is negligible.

Correlations among the three latent factors were moderate as follows: Family with Friends = .53 ($p < .001$), Family with Significant Other = .56 ($p < .001$), and Friends with Significant Other = .62 ($p < .001$).

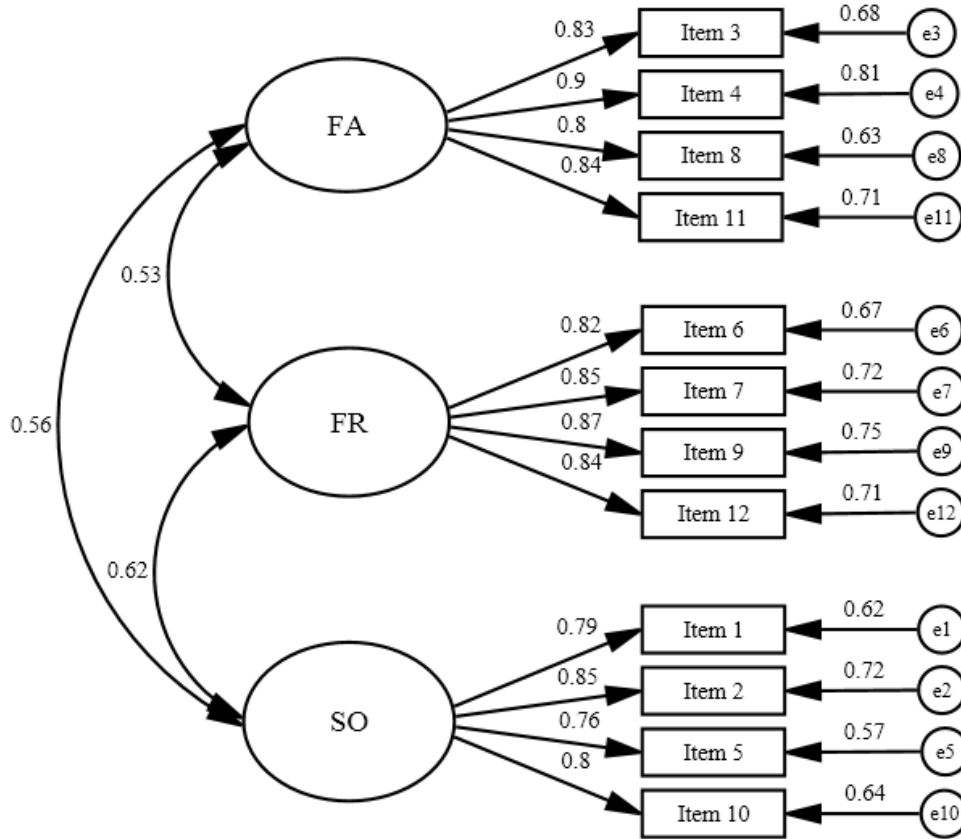


Figure 1. Factor structure of the MSPSS (FA = Family, FR = Friends, SO = Significant Other)

Factorial invariance across gender and age. As shown by the tests summarized in Table 5, the model with three latent factors was invariant across gender and age (group 1 = adolescents aged 14-16, N = 335; group 2 = adolescents aged 17-19, N = 367). For both the configural models (i.e., factor patterns with no constraints) and models with factor loadings constrained to be equal across gender or age, statistical fitting was good (CFI > .95, while RMSEA was slightly above .05). When models in which factor loadings were constrained to be equal were compared with configural models, the values of $\Delta\chi^2$ were not significant.

Table 5. Tests of factorial invariance across gender and age
(model with three intercorrelated factors)

Goodness-of-fit indices	Invariance across gender		Invariance across age	
	Configural model	Model with factor loadings constrained to be equal	Configural model	Model with factor loadings constrained to be equal
χ^2	297.71 ***	312.29 ***	335.56 ***	340.66 ***
df	102	111	102	111
$\Delta\chi^2$	-	14.58 ^a	-	5.1 ^a
Δ df	-	9	-	9

CFI	.965	.964	.960	.961
RMSEA	.052	.051	.057	.054
90 % CI for RMSEA	.046-.059	.044-.058	.050-.064	.048-.061

Note: Non-significant difference from unconstrained model. *** $p < .001$

Construct validity. As expected, the status of the family-of-origin had a significant effect on the score in the perceived social support from family ($F = 30.91$; $p < .001$). Thus, the adolescents living in intact families ($M = 5.22$; $SD = 1.21$) had a significantly higher score ($t_{\text{Bonferroni}} = 5.12$; $p < .001$; $d = .81$) than adolescents living in temporarily disintegrated families ($M = 4.16$; $SD = 1.57$). Also, compared to adolescents living in permanently disintegrated families ($M = 3.65$; $SD = 1.10$), those living in intact families reported a significantly higher level of family support ($t_{\text{Bonferroni}} = 6.99$; $p < .001$; $d = 1.33$). No significant difference was found between adolescents living in temporarily disintegrated families and those living in permanently disintegrated families ($t_{\text{Bonferroni}} = 1.92$; $p > .05$).

Concurrent validity. The MSPSS subscales showed positive and moderate correlations with life satisfaction score and negative correlations with the emotional well-being score (Table 6). The correlations with the indicators of subjective well-being had comparable values. For the entire sample, the correlations between MSPSS subscales and MHI-5 were: Family = $-.53$ ($p < .001$), Friends = $-.41$ ($p < .001$), Significant Other = $-.31$ ($p < .001$), and total MSPSS = $-.51$ ($p < .001$). Except for the Significant Other, the negative correlations with perceived stress were significant, but the values were more modest than the correlations with the indicators of subjective well-being. Of all MSPSS subscales, Family presented the most consistent relationships with the measures of well-being and stress.

Table 6. Correlations between the MSPSS total and subscale scores, overall satisfaction with life, and affective well-being

MSPSS subscales	SWLS	MHI-5	PSS
Family	.66 ***	-.63 ***	-.35 ***
Friends	.58 ***	-.57 ***	-.28 ***
Significant Other	.52 ***	-.49 ***	-.09
MSPSS total	.65 ***	-.63 ***	-.34 ***

Note: SWLS = Satisfaction with Life Scale (N = 245); MHI-5 = Mental Health Inventory-5 (N = 245); PSS = Perceived Stress Scale (N = 457). *** $p < .001$

Comparisons by gender and age. Table 7 summarizes the mean and standard deviations for the MSPSS subscales as a function of gender and age. The multivariate tests showed a significant

main effect for gender (Pillai's $F = 17.39$; $p < .001$), but not for age (Pillai's $F = .91$; $p > .05$). Univariate tests showed that girls perceived more social support from family ($F = 6.32$; $p < .05$), friends ($F = 7.23$; $p < .01$), and significant other ($F = 49.84$; $p < .001$) than boys. Also, the mean total MSPSS score was significantly higher in girls ($F = 23.75$; $p < .001$).

Table 7. MSPSS subscale means and standard deviations by gender/age subsamples

MSPSS subscales	Girls		Boys		Adolescents aged 14-16 years		Adolescents aged 17-19 years	
	M	SD	M	SD	M	SD	M	SD
Family	5.49	1.23	5.24	1.47	5.33	1.39	5.44	1.29
Friends	5.10	1.18	4.84	1.41	4.99	1.37	5.00	1.20
Significant Other	5.67	1.09	5.04	1.29	5.38	1.24	5.44	1.19
Total	5.42	.90	5.04	1.19	5.23	1.08	5.29	1.02

Note: $N = 702$

There was no significant effect of age on the scores for perceived social support from family ($F = 1.91$; $p > .05$), friends ($F = 0.08$; $p > .05$), significant other ($F = 1.40$; $p > .05$), and from all the three sources ($F = 1.36$; $p > .05$).

5. Study 3

5.1. Participants and procedure

At Time 1, 160 high school students filled out the MSPSS. Students were recruited from a top public high school. At Time 2 (retest was carried out three or four weeks after the first administration), only 149 (81 girls and 68 boys) of the 160 students completed the MSPSS again, resulting in a retest rate of 93.1%. Students were aged 14 to 18 years ($M = 16.36$; $SD = .95$).

The Ethics Committee of the Department of Psychology, "Alexandru Ioan Cuza" University (Iasi, Romania) granted ethical approval for the study. In obtaining consent from participants, a similar approach to that used in studies 1 and 2 has been pursued. To match the pairs of measurements required to estimate test-retest reliability of the MSPSS, all study protocols were coded numerically.

5.2. Statistical analyses

Based on the data obtained through factor analyses (see Studies 1 and 2), the scores on MSPSS subscales were computed by averaging the items which were entered into the corresponding latent factors. The total MSPSS score was obtained by averaging all items. Both for the total sample and the boys and girls subsamples, the internal consistency of MSPSS subscales and total was estimated by Cronbach's α coefficient. It has been suggested that .70 and above are

acceptable reliability coefficients (Nunnally, 1978). An additional item analysis aimed at estimating the corrected item-total correlation as well as internal consistency for all sets of items obtained by removing each item. Test-retest reliability was estimated by correlating the scores at Time 1 and Time 2. At least moderate correlations are desirable to conclude on the test-retest reliability of a measure.

5.3. Results

Internal consistency. Table 8 presents the internal consistency of MSPSS. For the total sample, α coefficient for the 12-item MSPSS was equal to .89 (Time 1) and .91 (Time 2). At Time 1, internal consistencies for Family, Friends, and Significant Other subscales were .87, .91, and .91, respectively, with a slightly lower value for Family. At Time 2, the internal consistencies of the three subscales were slightly higher (.92-.94). At Time 1, comparable coefficients were obtained for boys and girls, with values ranging from 0.86 for Family subscale with boys, .91 for both Friends subscales with girls and boys, and Significant Other with boys. At Time 2, both girls and boys revealed slightly higher values (.90-.95) of internal consistency for the MSPSS subscales. Also, for both girls and boys, total MSPSS had excellent internal consistency both at Time 1 and Time 2.

Table 8. Cronbach's α for MSPSS subscales (Time 1 and Time 2)

MSPSS subscales	Total sample	Girls	Boys
Family	.87 (.92)	.90 (.93)	.86 (.90)
Friends	.91 (.94)	.91 (.92)	.91 (.94)
Significant Other	.91 (.94)	.90 (.93)	.91 (.95)
Total	.89 (.91)	.90 (.92)	.86 (.91)

Note: Values between parentheses are for Time 2

At Time 1, the corrected item-total correlations (Table 9) ranged from .41 to .71 (mean = .59). Item-total correlations were lower for Family subscale, but acceptable ($\geq .40$). At Time 2, the corrected item-total correlations ranged from .52 to .80 (mean = .66). Again, item-total correlations were lower for the Family subscale, but were acceptable ($\geq .50$). Therefore, these results suggest that for the current adolescent sample, the items in the Family subscale had a slightly lower contribution to the total MSPSS score. However, these items shared between 16.8% and 31.3% (Time 1) and between 27.0% and 34.8% of the common variance of total MSPSS score. However, the amount of common variance of total MSPSS score suggests that keeping the Family subscale would quite substantially contribute to explaining the individual differences in adolescents' perception of the social support they receive from social networks.

Table 9. Corrected item-total correlations and α if item deleted (Time 1 and Time 2)

MSPSS items	Time 1 (test)		Time 2 (retest)	
	Corrected item-total correlation	α if item deleted	Corrected item-total correlation	α if item deleted
1	.68	.87	.74	.90
2	.71	.87	.80	.90
3	.41	.88	.52	.91
4	.56	.88	.59	.91
5	.69	.87	.73	.91
6	.62	.88	.69	.91
7	.63	.87	.70	.91
8	.46	.88	.53	.91
9	.65	.87	.72	.91
10	.62	.87	.70	.91
11	.45	.88	.54	.91
12	.62	.87	.69	.91

Note: N = 149

Test-retest reliability. For the MSPSS subscales, test-retest reliability was good, with correlations between the scores obtained at Time 1 and Time 2 higher than .75 (Table 10). For the total MSPSS score, test-retest reliability was .78. Subscales Family, Friends, and Significant Other showed a test-retest reliability ranging between .73 and .76 (girls) and between .78 and .82 (boys). For total MSPSS, test-retest reliability was .73 (girls) and .81 (boys). Compared to girls, boys showed higher levels of test-retest reliability for both the MSPSS subscales and total MSPSS.

Table 10. Test-retest reliability for MSPSS subscales

MSPSS subscales	Total sample	Girls	Boys
Family	.79 ***	.76 ***	.81 ***
Friends	.78 ***	.73 ***	.82 ***
Significant Other	.78 ***	.75 ***	.78 ***
Total	.78 ***	.73 ***	.81 ***

Note: *** p < .001

6. General discussions

The literature emphasizes that to capture the differential impact of social support on adjustment to the developmental tasks of adolescence and young adulthood, accurate and reliable measures of social support is required (Vaux, 1992). MSPSS is one of the most widely used measures of perceived social support. This instrument allows a rapid assessment of the perceived availability and adequacy of social support from family, friends, and significant other. MSPSS has received considerable attention from researchers worldwide. Its psychometric features have been investigated in samples of adolescents, students, or adults with racially, ethnically, culturally, and

linguistically diverse backgrounds (Bruwer et al., 2008; Chou, 2000; Duru, 2007; Edwards, 2004; Ramaswamy, Aroian & Templin, 2009). In Romania, the psychometric properties of MSPSS were first assessed in a sample of young people and adults (Marian, 2007). In the current paper, the findings of the first study aimed at assessing the psychometric characteristics of MSPSS in three samples of adolescents who were native Romanian speakers are summarized. To the best of our knowledge, this is the first study that provides data on the validity and reliability of the MSPSS among Romanian adolescents.

Results of the exploratory factor analysis (Study 1) provide evidence for the internal validity of the MSPSS with three extracted factors (i.e., support from family, friends, and significant other) which accounted for almost 74% of the total item variance. The factors contributed approximately equally to explaining the total item variance. In our study, the correlations between factors were moderate to mild. These results provide evidence that the factors captured with MSPSS are conceptually distinct. Our results are consistent with those reported by other studies conducted in American adolescents (Canty-Mitchell & Zimet, 2000), Hispanic adolescents (Edwards, 2004), and Turkish college students (Duru, 2007). A study conducted on a sample of Chinese adolescents failed to replicate the three-factor measurement pattern of MSPSS (Chou, 2000). However, in the study conducted by Edwards, support from family was the factor that had a much greater contribution to explaining the total item variance compared with the other two factors (Edwards, 2004). By contrast, in the study carried out by Duru in Turkish college students, support from friends had a much greater contribution in explaining the total variance (Duru, 2007). These variations in the explanatory power of the factors that underlie the responses to MSPSS suggest that the social support from family, friends, or significant other as perceived by adolescents and young people varies due to possible cultural and developmental differences.

The factorial pattern was replicated with a second adolescent sample (Study 2). Bruwer and his colleagues (2008) used a sample of South African adolescents from diverse racial backgrounds and reported a better statistical fit for a measurement model with three intercorrelated factors. Moreover, the results of the multi-group factor analysis revealed the invariance of the measurement model with three intercorrelated latent factors across gender and age of adolescents. These results suggest that the MSPSS items operate equivalently across the gender and age of adolescents. This means that the differences between girls and boys and between older and younger adolescents could be interpreted as resulting from the current differences in the adequacy and availability of the perceived social support from family, friends, and other significant persons rather than from the fact that MSPSS does not measure the same

constructs among different subpopulations of adolescents. In sum, the factor analysis results suggest that social support measured by MSPSS emerges as a multidimensional construct.

Studies 1 and 2 provide empirical evidence of MSPSS validity. Thus, the construct validity of the Family subscale was tested by comparing the mean score of adolescents living in intact families with the mean score of adolescents living in temporarily or permanently disintegrated families. As expected, the adolescents in intact families reported significantly higher levels of family social support compared to adolescents from disintegrated families. This result suggests that the score on the MSPSS Family subscale is sensitive to the deficit of effective parental support that can occur in disintegrated families. Also, discriminant validity was assessed by comparing the correlations between each MSLSS subscale and MSPSS Family subscale. As expected, compared with subscales Friends and Significant Other, the Family subscale of the MSPSS showed significantly higher correlations with the Family subscale of the MSLSS. These results were obtained for both the total sample and the boy and girl subsamples in Study 1. However, our results were consistent with earlier findings (Edwards, 2004; Ramaswamy, Aroian & Templin, 2009). Concurrent validity of the MSPSS is supported by significant correlations with measures of satisfaction with family, satisfaction with life, emotional well-being (i.e., negative affective disposition), perceived stress, the likelihood of engaging in health/safe-related risk behaviors, and suicidal risk. It should be noted that all correlations were in the expected direction. Correlations with satisfaction with family and emotional well-being were consistent with the data reported with other adolescent samples (Bruwer et al., 2008; Edwards, 2004).

The values of Cronbach's α coefficient in three studies indicate that MSPSS, as well as its three subscales, have excellent internal consistency. Internal consistencies across the three studies were comparable. Moreover, they were comparable to both those reported by Zimet et al. (1988) for a college student sample in which the psychometric properties of the MSPSS were initially tested and those reported by Bruwer and his collaborators (2008), and Canty-Mitchell and Zimet (2000) for adolescent samples. Study 3 provides consistent evidence of test-retest reliability of the MSPSS. The correlations between measurements at Time 1 and Time 2 were consistent both for the total sample of adolescents, for girls, and boys. Furthermore, for Family and Friends subscales, our results were consistent with those reported by Duru (2007) in a sample of 90 Turkish students who completed the MSPSS twice, with retest within four weeks. In our study, Significant Other and total MSPSS had test-retest reliabilities slightly lower than those reported by Duru (2007). In sum, our results indicate that MSPSS is a reliable measure that can be used to capture the perceived social support among adolescents.

Both in Study 1 and Study 2, girls reported higher levels of perceived support from friends, significant other, and total support. In Study 2, girls also reported a higher level of family support. Data on support from friends and significant other are consistent with those previously reported (Bruwer et al., 2008; Canty-Mitchell & Zimet, 2000; Cheng & Chan, 2004; Ramaswamy, Aroian & Templin, 2009; Zani, Cicognani & Albanesi, 2001). In our studies, both girls and boys reported moderate to high levels of social support from family. However, the mean for support from family were significantly higher compared with the mean for support from friends. This result confirms the primary role of the family in the developmental trajectory of preadolescent girls and boys (Furman & Buhrmester, 1992). On the other hand, the difference between girls and boys in perceived support from friends is consistent with the literature on gender differences in seeking and obtaining social support as a strategy for coping with stress (Frydenberg & Lewis, 1993; Hampel & Petermann, 2005). Also, the importance of friendship among adolescents of different racial and ethnic backgrounds may be taken into consideration (Furman & Buhrmester, 1992; Zani, Cicognani & Albanesi, 2001).

According to earlier findings, in their attempt to cope with stressful life events, girls seek more social and emotional support from peers than boys do. Cheng and Chan (2004) gave a possible explanation of the difference between girls and boys in terms of support from friends. Thus, this is based on the fact that girls tend to seek privacy and prefer self-disclosure to same-sex friends to a greater extent. It has been suggested that if mutual disclosure contributes to a stronger orientation of girls towards seeking social support from same-sex friends, the gender gap should be more pronounced for emotional support than for other types of support. Using the scores obtained by 2015 adolescents in Hong-Kong for items 9 and 12, and items 6 and 7, respectively, on the MSPSS Friends subscale, Cheng and Chan (2004) reported some empirical evidence for their hypothesis which is not convincing.

Another factor that can be invoked to explain the gender differences in social support from friends and significant other is the pattern of socialization of girls and boys, which is heavily dependent on cultural contexts. For example, in the Romanian dominant cultural context, girls are encouraged to express their own emotions and to ask for help in times of great stress. On the other hand, boys are expected to be more oriented toward self-control and active coping, such as problem-solving. This is in line with prevailing stereotypes in Western cultures that portray boys as more emotionally self-controlled and girls as more emotionally-oriented. Furthermore, empirical evidence supports some of these images. For example, researchers have found that in adolescence, there are consistent gender differences in the expression of emotions, particularly

negative ones (Cook & Cook 2009). It has been suggested that male infants are more emotionally reactive than female, but that the dominant culture socializes boys to express fewer emotions as they get older. As a result, boys become less skilled in asking and obtaining emotional and social support when they are confronted with developmental and life adversities.

One of the limitations of this study is that the samples consist exclusively of urban adolescents who are predominantly Orthodox Christians. In Romania, the rural population is still well represented. Also, families in rural communities may differ from those in urban areas in terms of social characteristics. On the other hand, rural communities are smaller and this aspect should be related to the physical and social proximity of its members. The proximity-based network, in turn, facilitates more stable and deeper social contacts. Social contacts create more opportunities for giving and receiving various types of social support that adolescents need to successfully adapt to developmental adversities. Zani and collaborators (2001) showed that the sense of community tends to be slightly higher among adolescents living in small towns compared to those living in large towns. In the context of the above-mentioned study, MSPSS scores showed positive correlations with indicators of the sense of community. As to the religious background, this variable is also important because the meaning of the term “Significant Other” varies, as suggested by the authors who were concerned with the adaptation and psychometric assessment of MSPSS for Muslim adolescent and adult populations (Aroian, Templin & Ramaswamy, 2010; Ramaswamy, Aroian & Templin, 2009). Thus, the data obtained with the Romanian adolescent samples which are more heterogeneous in terms of residence and religious affiliation is useful.

7. Conclusions

In summary, the findings of this study indicated that the MSPSS is a psychometrically sound measure of adequacy and availability of social support. Thus, it possesses excellent internal consistency and good test-retest reliability. Our data confirmed its multidimensional structure and concurrent validity. With these psychometric properties, MSPSS can be administered with confidence to Romanian adolescents, to capture their perception about social support from family, friends, and significant other.

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APPENDIX: The Multidimensional Scale of Perceived Social Support (MSPSS) – English and translated Romanian versions

1. There is a special person who is around when I am in need (Există în viața mea o persoană specială care îmi este alături, atunci când am nevoie).
2. There is a special person with whom I can share my joys and sorrows (Există o persoană specială pentru mine, cu care pot să-mi împart bucuriile și nemulțumirile).
3. My family really tries to help me when I am in need (Familia mea se străduiește să mă ajute, atunci când am nevoie).
4. I always get the emotional help and support I need from my family (Întotdeauna obțin ajutorul emoțional și suportul de care am nevoie din partea familiei mele).
5. I have a special person who is a real source of comfort to me (Am o persoană specială care este o adevărată sursă de confort pentru mine).
6. My friends really try to help me when I am in need (Prietenii mei se străduiesc să mă ajute, atunci când am nevoie).
7. I can count on my friends when things go wrong (Atunci când lucrurile din viața mea merg prost, pot conta pe prietenii mei).
8. I can talk about my problems with my family (Pot discuta problemele pe care le am cu familia mea).
9. I have friends with whom I can share my joys and sorrows (Am prieteni cu care pot să-mi împart bucuriile și nemulțumirile).
10. There is a special person in my life who cares about my feelings (În viața mea, există o persoană specială căreia îi pasă de sentimentele mele).
11. My family is willing to help me make decisions (Familia mea este întotdeauna dispusă să mă ajute să iau anumite decizii).
12. I can talk about my problems with my friends (Pot să vorbesc cu prietenii mei despre problemele pe care le întâmpin).