

Original Article

Factor Structure and Psychometric Properties of the Greek Version of the Coping Strategy Indicator

Constantinos Togas, M.Sc., M.Sc., Ph.D(c)

Social Worker-Psychologist

George Alexias, Ph.D

Professor of Sociology of Health and Body, Department of Psychology, Panteion University of Social and Political Sciences

Correspondence: Togas Constantinos, 28 Andrea Labrou Street, Megalopolis, Arkadia, Greece, Postal Code: 22200 E-mail: togascostas@yahoo.gr

Abstract

Background: the Coping Strategy Indicator (CSI) is a wholly empirically derived questionnaire, used to evaluate a person's coping strategies.

Aim: to examine the factor structure and psychometric properties of the Greek version of the Coping Strategy Indicator in a community sample in Greece.

Methods: At first, the questionnaire was translated in the Greek language. In the next step, a cross-sectional study was conducted with a sample of 3544 individuals ($n=3544$) of Greece's general population (men: 1336-37.7 % and women: 2192-62.1%). The mean age of the sample was 33,61 years. A composite questionnaire was used including the Coping Strategy Indicator, the Multidimensional Scale of Perceived Social Support, the Rathus Assertiveness Schedule and the General Health Questionnaire-28. The statistical program SPSS 23.0 was used for the analysis.

Results: the Greek CSI consists of four factors (Problem Solving, Seeking Social Support, Avoidance-Distraction and Avoidance-Withdrawal). The internal consistency was very satisfactory for the whole questionnaire ($\alpha=.859$) and for Problem Solving ($\alpha=.925$) and Seeking Social Support ($\alpha=.883$) scales and appreciably lower for Avoidance-Distraction ($\alpha=.68$) and Avoidance-Withdrawal ($\alpha=.57$) scales. Test-retest reliability ranged from .902 to .934 for all four scales. Furthermore, the construct (convergent and discriminant) validity of the CSI scales was satisfactory, as they were significantly correlated (positively and negatively) with the perceived social support, the assertiveness and the mental health problems. The study also provides data concerning the relationship with demographics.

Conclusions: The CSI is suitable for research use both in men and women samples in Greek speaking persons as a way of assessing their coping strategies.

Key-words: stress, coping, Coping Strategy Indicator, Greek version.

Introduction

Coping with an adversity includes innumerable ways of dealing with diverse person-environment transactions and it does not represent a homogeneous concept. It refers to a variety of cognitive and behavioural strategies individuals use to manage their stress (Folkman & Moskowitz, 2004) and to master, reduce or tolerate demands. These demands may be imposed from the outside (i.e. by family, friend, job, school) or from inside (i.e. while wrestling with an emotional conflict) (Folkman & Lazarus, 1980). Coping efforts may have a positive goal, but people sometimes adopt coping strategies

that actually get them into more difficulty (Baqtayan, 2015).

People are not very stable in the coping strategies that they use. The selection of a coping strategy is affected by gender and age and the problem's context and appraisal (Folkman & Lazarus, 1980).

Researchers have grouped the ways people cope with stress into four categories: 1) they may decide to fight the realities of experienced stress, 2) they may decide to flight or leave what make them feel stressed, 3) they may reduce their stress through such activities like social support,

and religious orientation and 4) they may decide to accept their life as it is (Baqtayan, 2015).

Folkman and Lazarus (1980,1985) concentrate on two types of coping strategies: problem-focused coping, in which efforts are made to change the stressful situations through problem solving, decision-making and/or direct action and emotion-focused coping, in which attempts are made to regulate distressing emotion. Although this categorization has not always defined separate factors, previous research has consistently identified factors that differentiate between coping with or without the aid of social support. These findings suggest it may be more meaningful to distinguish between “socially supported” and “self-sufficient” coping styles rather than whether the corresponding strategies are directed towards managing either problems or emotions (Litman, 2006).

Moreover, psychologists have distinguished the active coping, in which a person may decide to face the realities of the experienced stress and clarify the problem through negotiations with other members and the passive coping, in which a person may decide to suffer or deny the experienced stress (Baqtayan, 2015). Another distinction is between avoidance-oriented coping (ignoring or withdrawing from the stressor or associated feelings) and approach-oriented coping (directed towards dealing with either the problem or related emotions) (Roth & Cohen, 1986).

Largely predicated on Folkman and Lazarus’ (1980, 1985) classic work a burgeoning literature has sought to investigate the basic coping strategies and to develop standardised coping assessments (Desmond, Shevlin, & MacLachlan, 2006). One of these measures is the Coping Strategy Indicator (Amirkhan, 1990), which is the only coping questionnaire that was wholly empirically derived. The questionnaire has been translated into many languages (Spanish, French, Hebrew, Chinese, Korean, Czech etc) and some studies support a clear three-dimensional structure (Ptacek, Smith, Espe, & Raffety, 1994; Clark, Bormann, Cropanzano & James, 1995; Bijttebier & Vertommen, 1997), similar to the original validation. However, another study (Ager & MacLachlan, 1998) proposed a four-factor model involving the bipartition of the Avoidance factor (Avoidance-Withdrawal, Avoidance-Distraction) and the authors noted that the reliability of scores derived from these

two scales is questionable. This division was also evident in the original validation but was rejected on the grounds that “the addition of a fourth-factor did not appreciably increase explained variance, and, in fact simply split the avoidance strategy into two highly correlated subsets” (Amirkhan, 1990).

The CSI is psychometrically superior to other coping questionnaires and its scales are internally consistent and yield stable scores. Convergent validity has been demonstrated, both in terms of convergence with existing measures of coping, personality and pathology, and in terms of non-covariation with social desirability indices. Criterion validity is evidenced by the CSI’s ability to predict actual coping responses made in both laboratory simulations and real-world settings (Amirkhan, 1994).

The aim of this study was to translate the Coping Strategy Indicator in the Greek language and to examine its factor structure and its psychometric properties.

Based on the theoretical principles of coping theory and on the studies of validation of CSI and its dimensional analysis in other samples, it was hypothesized that: 1) the CSI consists of three factor (Hypothesis 1), 2) the Problem Solving strategy and the Seeking Social Support strategy are positively associated with the Assertiveness and the Perceived Social Support correspondingly and negatively with the mental health problems (as they are evaluated with the GHQ-28) (Hypothesis 2), 3) the Avoidance strategy is positively associated with the mental health problems and negatively with the assertiveness and the perceived social support (Hypothesis 3). Hypotheses 2 and 3 were chosen to examine the construct (convergent and discriminant) validity of CSI, 4) there are significant differences in the CSI score related to demographic characteristics (sex, age etc) and to the type of the reported stressor (Hypothesis 4).

Method

Translation of the questionnaire

The translation strategy was based on minimal translation criteria (Scientific Advisory Committee of the Medical Outcomes Trust, 2002). Two bilingual professionals translated the questionnaire into Greek (forward translation) and then followed the reconciliation report from a bilingual professional who has Greek as mother language. The reconciled version was

translated into English by two native English people who were blinded to the original version (backward translation) and was sent to the questionnaire's constructor (Professor J.H. Amirkhan) for comments and suggestions, which were used for the final version.

The variable "Household income", which consists of six subcategories (less than \$15,000, \$15,000-\$24,999 etc) was transformed to six subcategories of the same amount Greek currency (euros).

Finally, twenty people were randomly assigned for the pre-testing of the translated instrument and were asked for their interpretation of the questions, their general impression on its clarity and to give translation alternatives. Their suggestions were used in order to prepare the instructions and to ensure that participants had no difficulties in reading the items. The average time of the questionnaire's answering was also measured and was found to be 8 minutes.

Design

A cross-sectional study was conducted with a sample of 3544 individuals ($n = 3544$) of Greece's general population. The duration of the study was 22 months (15 October 2015-18 August 2017). The participants were selected based on the following eligibility criteria: 1) male-female persons, 2) age > 18 years, 3) residents of Greece, 4) ability to speak-understand of the Greek language. Persons who had severe psychiatric symptoms and were unable to respond to the questions were excluded from the study.

A snowball recruitment procedure was used in order to obtain a representative sample.

A composite questionnaire was administered to the participants including the following scales: 1) Coping Strategy Indicator (CSI), 2) Multidimensional Scale of Perceived Social Support (MSPSS), 3) Rathus Assertiveness Schedule and 4) General Health Questionnaire-28 (GHQ-28). These questionnaires have been translated and culturally adapted in Greek population and used by several scholars.

The participants were informed in detail about the purpose of the study and were given assurances of anonymity and confidentiality of the information. All of them took part on a voluntary basis, without taking any remuneration.

The test-retest reliability of the CSI was examined by a new study. The participants completed the CSI in reference to that same stressor four weeks later under the same conditions of the first study. About the same period of time (four to eight weeks) was also used in the original validation of the CSI (Amirkhan, 1990).

Participants

The mean age of the participants was 34 years ($M_{age} = 33,61$, $SD = 12,85$; $Min = 18$, $Max = 82$ years old). The rest demographic characteristics of the sample and type of stressor are presented in Table 1.

The sample used for the testing of the test-retest reliability consisted of 200 persons randomly selected, aged between 18-66 ($M_{age} = 35.47$, $SD = 14.64$). The 39.4% of the sample were men and the 60.6% were women. Most of the participants were higher education graduates or students (84.4%).

Measures

Coping Strategy Indicator (CSI)

The questionnaire first requests demographic information and then asks the participants to describe a recent (within the previous six months) stressful event. It consists of 33 items divided in three scales: 1) Problem Solving (i.e. "Rearranged things around you so that your problem had the best chance of being resolved"), 2) Seeking Social Support (i.e. "Let your feelings out to a friend") and 3) Avoidance (i.e. "Tried to distract yourself from the problem"). Responses are indicated by means of a three point scale: a lot (3), a little (2), or not at all (1). There is a total score for each scale and the higher score indicates greater use of the corresponding coping strategy (Amirkhan, 1990).

In the original validation the reported problems were grouped in four categories (work/school related, interpersonal, personal change, fate events) but in this study they were grouped according to DSM-IV-TR classification (AXIS IV "Psychosocial and Environmental Problems") (American Psychiatric Association, 2000).

Multidimensional Scale of Perceived Social Support (MSPSS)

It consists of 12 items and measures perceptions of support from 3 sources: Family, i.e. "My

family really tries to help me”, Friends, i.e. “My friends really try to help me” and Significant Other, i.e. “There is a special person who is around when I am in need” (Zimet, GD, Dahlem, Zimet, SG & Farley, 1988).

A seven-point Likert scale is used for the rating and the total score is the sum of all items divided by 12. The higher score indicates greater level of perceived social support. There is also a mean score for each subscale.

The questionnaire has been translated into many languages and has been shown to have good to excellent psychometric properties (Zimet, Dahlem et al., 1988). In this study, the Greek translation of MSPSS (Theofilou, 2015) was used and Cronbach’s α was equal to .915.

Rathus Assertiveness Schedule (RAS)

It is a 30-item self-report instrument (Rathus, 1973) and measures an individual’s assertiveness or what the author called social boldness, i.e. “When I am asked to do something, I insist upon knowing why”. Each item is answered from +3 to -3, without including 0 and seventeen items are reverse-scored. The total score is determined by summing item ratings (range: -90 to +90) and high positive scores indicate high assertiveness.

The questionnaire does not provide a unidimensional index of assertiveness, but rather measures a number of factors including situation-specific assertive behavior, aggressiveness and a more general assertiveness (Law, Wilson & Crassini, 1979). It has evidence of good internal consistency, test-retest reliability and concurrent validity (Fischer & Corcoran, 1994).

In this study the Greek version of RAS (Tsitsas, Theodosopoulou, & Malikiosi-Loizou, 2003) was used and Cronbach’s α was equal to .816.

General Health Questionnaire-28 (GHQ-28)

It is used to detect possible psychological disorder (Goldberg, 1978) and identifies the inability of a person to carry out normal functions and the appearance of new and distressing phenomena (Goldberg & Hillier, 1979).

The GHQ-28 is not designed to detect chronic mental health conditions. It consists of 28

questions divided in four subscales: Somatic symptoms (i.e. “Have you recently been feeling perfectly well and in good health?”), Anxiety/insomnia (i.e. “Have you recently lost much sleep over worry?”), Social dysfunction (i.e. “Have you recently been managing to keep yourself busy and occupied?”), Severe depression (i.e. “Have you recently felt that life is entirely hopeless?”).

The total score ranges from 0 to 84 and higher scores indicate a greater possibility of psychological distress (Goldberg & Hillier, 1979). There is also a score for every subscale. The GHQ-28 has high test-retest reliability and construct validity (Robinson & Price, 1982). In the present study the Greek version of the questionnaire (Garyfallos, Karastergiou, Adamopoulou, Moutzoukis, Alagiozidou, & Mala, 1991) was used and Cronbach’s α was equal to .911.

Data analysis

The program SPSS 23.0 was used for the analysis of data and the statistical significance was set to 5%. Results were obtained by means of descriptive statistics, T-test, ANOVA and Pearson’s correlation. Moreover, both Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were carried out in order to examine the factor structure of the CSI. In EFA the number of factors was determined according to those with eigenvalues >1, as well as by examining the scree plot. CFA was performed by using the program AMOS (Analysis of Moment Structures; Arbuckle, 2012).

The suitability of the CFA solution was evaluated using the following model fit indices: χ^2/df ratio, CFI, TLI, ECVI, AIC and RMSEA. A smaller than 3 χ^2/df ratio is considered acceptable. CFI values > .900 are indicative of good fit. A good fit is also indicated when RMSEA value is .10 or lower (Beauducel & Wittmann, 2005).

As far as the TLI concerns, Hu & Bentler (1999) proposed $\geq .95$ as a cut-off value for a good fit. The ECVI and the Akaike information criterion (AIC) are suitable for comparing competing models and the smaller values represent a better fit (Byrne, 2001).

Table 1. Demographic characteristics of the sample and type of stressor

	Frequency	Percentage (%)
Sex		
Men	1336	37.7 %
Women	2192	62.1 %
Age group		
<25 years	1371	39.0%
26-35 years	791	22.5%
36-45 years	589	16.7%
>45 years	767	21.8%
Household income		
<15.000 €	1483	42.3%
25.000-34.999 €	1039	29,6%
35.000-44.999 €	493	8,1%
45.000-60.000 €	284	3,8%
>60.000 €	73	2,1%
Education		
Illiterate –Primary school	57	1.0 %
Secondary school	92	2.6 %
Lyceum	846	24 %
Higher education (students or graduates)	2534	71.5%
Occupation		
Student	875	26.9%
Unemployed	323	9.9%
Private employee	815	25.1%
Civil Servant	625	19.2%
Businessman-Farmer	436	13.4%
Pensioner	93	2.9%
Housewife	84	2.6%
Type of stressor		
Problems with primary support group	725	36.3%
Problems related to the social environment	244	12.2%
Educational problems	208	10.4%
Occupational problems	262	13.1%
Housing problems	23	1.2%
Economic problems	250	12.5%
Problems with access to health care	16	.8%
Problems related to interaction with the legal	23	1.2%
Other psychosocial and environmental problems	236	11.9%

Table 2. Results of Confirmatory Factor Analyses

Model Tested	χ^2/df	CFI	TLI	ECVI	AIC	RMSEA
Model 1. Original model of Amirkhan (1990)	3.349	.780	.749	3.408	12072.831	.081
Model 2. Alternative 5-factor model after EFA	11.69	.207	.093	11.755	41648.67	.149
Model 3. Alternative 4-factor model after EFA (items 4 and 6 deleted)	2.578	.829	.801	2.635	9335.111	.076

Note: CFA: Confirmatory Factor Analysis, EFA: Exploratory Factor Analysis, CFI: Comparative Fit Index, TLI: Tucker-Lewis Index, ECVI: Expected Cross-validation Index, AIC: Akaike Information Criterion, RMSEA: Root Mean Squared Error of Approximation

Table 3. Factor structure (principal component analysis with varimax rotation) of the model 3 of the CSI

Item	Problem Solving	Seeking Social Support	Avoidance-Distraction	Avoidance-Withdrawal
2. Rearranged things around you so that your problem has the best chance of being resolved?	.680			
3. Brainstormed all possible solutions before deciding what to do?	.705			
8. Set some goals for yourself to deal with the situation?	.699			
9. Weighed your options very carefully?	.755			
11. Tried different ways to solve the problem until you found one that worked?	.614			
15. Thought about what needed to be done to straighten things out?	.710			
16. Turned your full attention to solving the problem?	.734			
17. Formed a plan of action in your mind?	.785			
20. Stood firm and fought for what you wanted in the situation?	.715			
29. Tried to solve the problem?	.737			
33. Tried to carefully plan a course of action rather than acting on impulse?	.745			
1. Let your feelings out to a friend?		.662		
5. Accepted sympathy and understanding from someone?		.550		
7. Talked people about the situation because talking about it helped you to feel better?		.710		
12. Confided your fears and worries to a friend or relative?		.687		
14. Told other people about the situation because just talking about it helped you to come up with solutions?		.740		
19. Went to (friend or professional) in order to help you feel better?		.544		

23.Went to friend to help you feel better about the problem?	.751	
24.Went to a friend for advice on how to change the situation?	.688	
25.Accepted sympathy and understanding from friends who had the same problem?	.578	
31.Accepted help from a friend or relative?	.681	
32.Sought reassurance from those who know you best?	.675	
18.Watched television more than usual?		.595
21.Avoided being with people in general?		.627
22.Buried yourself in a hobby or sports activity to avoid the problem?		.517
26.Slept more than usual?		.625
28.Identified with characters in novels or movies?		.555
10.Daydreamed about better times?		.639
13.Spent more time than usual alone?		.525
27.Fantasized about how things could have been different?		.649
30.Wished that people would just leave you left alone?		.540

Table 4. Means, standard deviations and scale intercorrelations

	Mean (SD)	Problem Solving	Seeking Social Support	Avoidance-Distraction	Avoidance-Withdrawal
Problem Solving	25.05 (6.41)	-			
Seeking Social Support	23.65 (5.73)	.413**	-		
Avoidance-Distraction	9.06 (2.71)	-.416**	-.176**	-	
Avoidance-Withdrawal	8.82 (2.11)	.344**	.222**	.104**	-

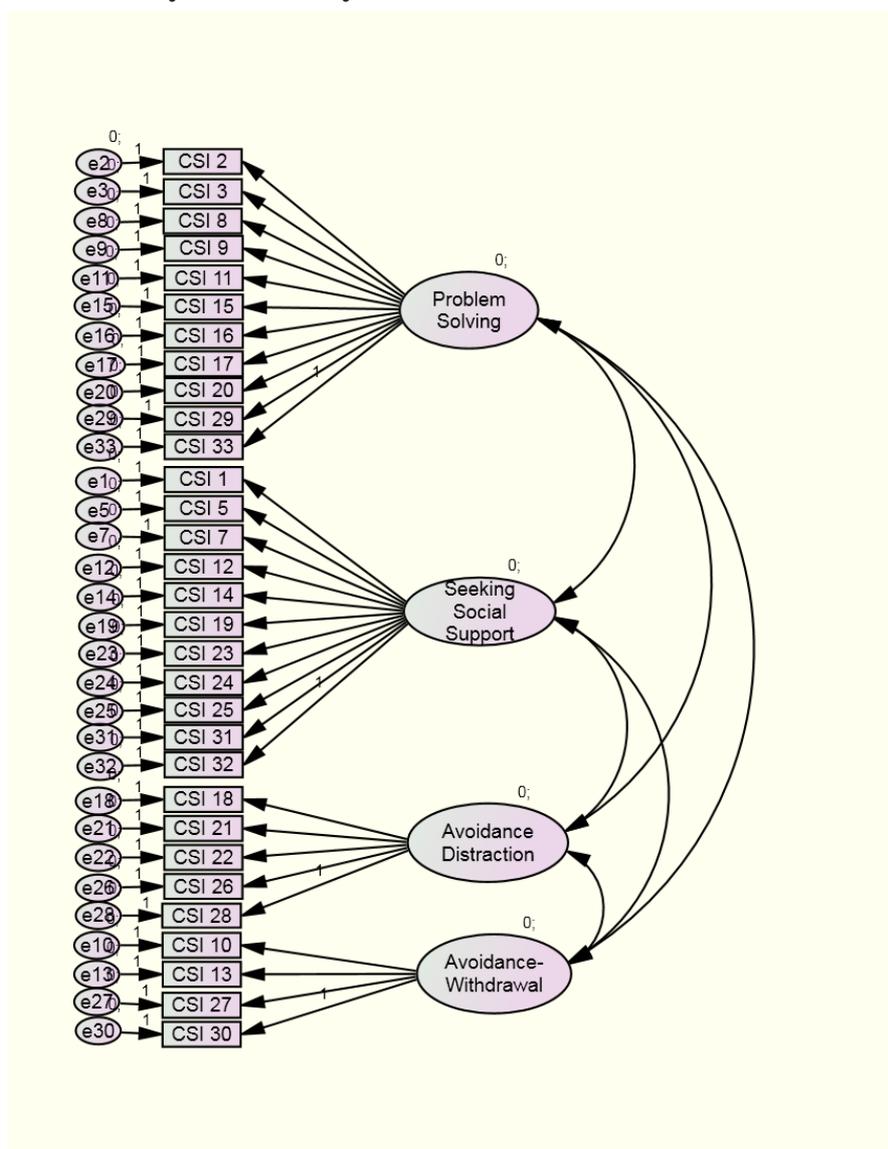
Note: ** $p < 0.01$

Table 5. Construct Validity Correlations

	Coping Strategy Indicator			
	Problem solving	Seeking Social Support	Avoidance-Distraction	Avoidance-Withdrawal
MSPSS				
Total Score	.037*	.131**	-.063**	-.081**
MSPSS				
Significant Other subscale	.046**	.113**	-.059**	-.064**
MSPSS				
Family subscale	.035*	.033	-.071**	-.100**
MSPSS				
Friends subscale	.007	.177**	-.023	-.033
Rathus Assertiveness Schedule (RAS)	.082**	.017	-.071**	-.073**
GHQ-28				
Total score	-.38*	.003	.081**	.172**
GHQ-28				
Somatic Symptoms	-.020	.017	.062**	.113**
GHQ-28				
Anxiety/Insomnia	-.026	.008	.085**	.163**
GHQ-28				
Social Dysfunction	-.016	.001	.002	.107**
GHQ-28				
Severe Depression	-.082**	-.048**	.107**	.116**

Note. ** $p < 0.01$, * $p < 0.05$

Figure 1. Confirmatory factor analysis for the four-factor model of the CSI (Model 3).



Results

Factor structure of the CSI

CFA for the original model of Amirkhan (1990)

The original three factor model (model 1) was first examined through CFA but the fit indices were not acceptable (see Table 2).

EFA in search of alternative structures

An EFA was conducted next in search of models with optimal goodness of fit. Bartlett's test of sphericity ($\chi^2=50813,019$, $p<.001$) and the Kaiser-Meyer-Olkin index (.943) confirmed that the CSI items had adequate variance for factor

analysis. The best solution revealed five factors with eigenvalues >1 , which explained 55,08 % of the variance (Model 2). However, only two items (4 and 6) loaded on factor 5 and their loading was not satisfactory.

The alternative model with three factors (supported in the original validation-Model 1) explained lower percentage of the variance (47,05%). The fact that only two items loaded in factor 5 and their loadings were not satisfactory led to the examination of one more model with four factors (model 3), in which items 4 and 6 were deleted. This model explained 54,35% of the total variance.

CFA for the alternative models 2 and 3. Comparison of fit indices of all three models

Following, a CFA was performed for models 2 and 3. At first, the 5-factor model (model 2) was examined. Factor I was loaded by items 2,3,8,9, 11,15,16,17,20,29,33 and Factor II was loaded by items 1,5,7,12,14,23,24,25,31,32. The other three factors were loaded as following: Factor III: items 18,19,22,26,28 Factor IV: items 10,13,21,27,30 and Factor V: items 4,6. This model did not fit the data and the fit indices were worse than model I (see Table 2).

In model 3 items 4 (“Tried to distract yourself from the problem?”) and 6 (“Did all you could to keep others from seeking how bad things really were?”) were deleted and the values of fit indices were not completely adequate but acceptable (see Table 2). This model is presented in figure 1 and its factor loadings are shown in Table 3. Also scale intercorrelations and mean scores are shown in Table 4. Intercorrelations were weak to medium and all of them significant.

In the last step, all three competed models were compared and the suitability of the CFA solution was evaluated using the model fit indices (see Table 2). χ^2/df ratio for Model 3 was 2.578, indicating an acceptable fit (Beauducel & Wittmann, 2005). The CFI value for the model 3 was higher than the other two models'. The RMSEA value for the model 3 indicated a good fit and the ECVI and AIC values for the model 3 were lower than for the models 1 and 2. Based on these, it is suggested that the four-factor model (model 3) is the best of the possible solutions. Although its fit to the data wasn't completely adequate, it demonstrated more explanatory power than the model 1 and better fit indices than model 1 and 2.

In model 3 factors 1 and 2 correspond with remarkable accuracy to the first two factors derived from the original validation (Factor I: problem solving, Factor II: seeking social support). The items that loaded in factor III (Avoidance) in the original validation are divided in two separate factors in the present study. Factor III evaluates a person's trend to overcome its problems by distraction (by avoiding being with people, by watching TV, by burying himself in a hobby or sports activity etc). This Factor is called “Avoidance-Distraction”. Finally, Factor IV evaluates a person's trend to overcome its problems by withdrawal, wishful thinking or daydreaming (by spending more time than usual

alone, by wishing that people would leave him alone or by daydreaming about better times etc). In the present study this factor is named “Avoidance-Withdrawal”.

Internal consistency

The internal consistency of the four scales of the CSI was analyzed by means of Cronbach's α coefficient. Its value was .925 for Problem Solving, .883 for Seeking Social Support, .68 for Avoidance-Distraction and .57 for Avoidance-Withdrawal scale. Furthermore, Cronbach's α coefficient was .859 for the 31 items of CSI (after the deletion of items 4 and 6). Consequently, the internal consistency was very satisfactory for the whole questionnaire and for Problem Solving and Seeking Support scales and appreciably lower for Avoidance-Distraction and Avoidance-Withdrawal scale.

Test-retest reliability

A positive and significant correlation between the two CSI scores was found in the test-retest sample for all four scales (Problem Solving: $r = .917, p < .01$, Seeking Social Support: $r = .905, p < .01$, Avoidance-Distraction: $r = .934, p < .01$, Avoidance-Withdrawal: $r = .902, p < .01$). The paired samples t-test revealed no significant differences between the two testing points. Cronbach's α coefficient for the four CSI scales ranged from .558 to .884 at the first administration and from .598 to .885 at the second. These findings suggest that the test-retest reliability for the Greek version of the CSI was good.

Construct validity

Construct validity was evaluated by examining the correlation of the CSI scores with the GHQ-28, the MSPSS and the Rathus Assertiveness Schedule scores. The GHQ-28 was administered because several indices of pathology have been used extensively as a validation criterion for coping measures (Amirkhan, 1990). It was also expected that perceived social support is positively related to seeking social support strategy and the problem solving strategy is positively related to a person's assertiveness.

Most of the correlation obtained (see Table 5) were significant (but of weak or moderate magnitude), confirming the hypotheses 2 and 3. These results suggest that the Greek version of the CSI has satisfactory construct (convergent and discriminant) validity.

Relationship to demographics

The mean score of the four scales of CSI was 25.05 (SD: 6.41) for Problem Solving Scale, 23.65 (SD: 5.73) for Seeking Social Support scale, 09.06 (SD: 2.71) for Avoidance-Distraction scale and 8.82 (SD:2.12) for the Avoidance-Withdrawal scale.

There was a significant weak positive correlation between age and Problem Solving scale ($r=.111$, $p=0.001$) and a negative one between age and Seeking Social Support scale ($r=-.035$, $p=0.037$) and Avoidance-Distraction scale ($r=-.083$, $p=0.001$).

Sex affected scores on the Seeking Social Support scale ($t=-4.76$, $df=3481$, $p=0.001$) and on the Avoidance-Withdrawal scale ($t=-3.123$, $df=3481$, $p=0.002$) and women had higher score than men in these scale.

The household income affected scores on the Problem Solving scale ($F=4.691$, $df=3458$, $p=0.001$) and on the Avoidance-Withdrawal scale ($F=6.887$, $df=3458$, $p=0.001$) and the participants of the category 15.000-29.999 euros had higher score than the participants of the category 25.000-34.999 euros and of the category 45.000-60.000 euros.

As far as the type of stressor and the education level concerns, no significant differences were found.

Discussion

This study examined the factor structure and psychometric properties of the Greek version of the Coping Strategy Indicator. The basic finding was that the CSI consists of four factors and its reliability and validity are satisfactory.

The structure of the Problem Solving scale and of the Seeking Social Support scale was similar to the initial CSI, but the findings with respect to Avoidance scale were more complex. Although some studies (i.e. Bijttebier & Vertommen, 1997; Ager & Maclachlan, 1998) support a clear three-dimensional structure of the CSI similar to the original validation (Amirkhan, 1990), in the present study Model 3, in which Avoidance was divided in two factors, appreciably explained more variance than the three factor solution and had the best fitting in the data. Similar findings are reported by Ager & Maclachlan (1998), who note that the reliability of scores derived from these two scales is questionable. It is notable that this four-dimensional pattern was also evidenced

in the original validation but was rejected on the grounds of parsimony (Amirkhan, 1990). Consequently, hypothesis 1 was not confirmed. The factor loadings for the CSI items indicate that they are relatively good indicators of their respective factors.

Items 4 and 6 of the initial questionnaire were deleted and the Greek version of the CSI consists of 31 items and four factors: Problem Solving, Seeking Social Support, Avoidance-Distraction and Avoidance-Withdrawal. These items were found to have low loading in the original validation (Amirkhan, 1990) and in other studies (Bijttebier & Vertommen, 1997; Ager & Maclachlan, 1998), too. In contrast with the original validation (Amirkhan, 1990) and with the Dutch version of the CSI (Bijttebier & Vertommen, 1997), intercorrelations between the scales didn't approximate to zero and were significant. The strongest correlation was between the Problem Solving and Avoidance-Distraction scales. Consistent with previous findings (Amirkhan, 1990; Bijttebier & Vertommen, 1997; Desmond et al., 2006) a strong correlation between Problem Solving and Seeking Social Support scales was found.

The scales of the questionnaire present high test-retest reliability. The internal consistency of the Problem Solving scale and of the Seeking Social Support scale proves also to be high, whereas that of the Avoidance-Distraction scale and Avoidance-Withdrawal scale turns out to be lower. The same result about the avoidance strategies is also reported by Bijttebier & Vertommen (1997) and may imply that avoidance refers to a more heterogeneous set of phenomena than social support seeking and problem solving. Moreover, this may be the reason that Avoidance strategies were split in two separate factors in the present study. Similar findings about the low internal consistency of Avoidance-Distraction scale and Avoidance-Withdrawal scale are also reported by Ager & Maclachlan (1998).

Furthermore, the CSI scales have satisfactory construct (convergent and discriminant) validity, as they are significantly correlated (positively and negatively) with the perceived social support, the assertiveness and the mental health problems. This result confirms the hypotheses 2 and 3 and it is consistent with the findings of the original validation (Amirkhan, 1990), in which high construct validity was reported.

Women had higher score than men in Seeking Social Support scale, as in the original study (Amirkhan, 1990) and in the Flemish sample (Bijttebier & Vertommen, 1997). The same result was found in Avoidance-Withdrawal scale. Partially similar results are reported by Ager & Maclachlan (1998) and the major effect of gender in their survey was the tend for male students to score higher on Problem Solving and female on Avoidance. There was a positive correlation between age and Problem Solving scale and a negative one between age and Seeking Social Support scale and Avoidance-Distracton scale. A significant negative correlation was found between age and Seeking Social Support for both men and women by Ager & Maclachlan (1998), too. In the Flemish sample age only had a very limited effect (Bijttebier & Vertommen, 1997). In contrast to these findings, Amirkhan (1990) didn't find any age effect. As far as education level concerns, no significant differences were found as in other studies (Amirkhan, 1990; Bijttebier & Vertommen, 1997). The type of stressor had not a significant effect on all CSI scales. In the original validation (Amirkhan, 1990), the type of stressor was examined as a dependent variable and only sex influenced the reporting stressor, men mentioning more work-related and women more interpersonal problems. These results concerning the relationship to demographics partially confirm hypothesis 4. Marital status, although clearly associated with CSI scores in the Flemish sample (Bijttebier & Vertommen, 1997), it was not examined in this study, as this variable was not included in the original questionnaire.

The advantages of this research included the large community sample, which is possibly the largest ever recruited to examine the factor structure and psychometric properties of the CSI in a Western country. As for the limitations, no coping strategies-specific questionnaire was administered in order to further examine the construct validity and the snowball sampling increases the likelihood that the sample is not representative of the total population (Heckathorn, 1997).

Despite these limitations, the Greek version of the CSI is both reliable and valid for the investigation of coping strategies. Moreover, it is highly acceptable by the participants because it is brief, comprehensible and easy to complete. Consequently, it is suitable for research use and

it could be used to examine the way a person copes with a stressor. However, the researchers must have in mind that CSI items do not reflect the full range of response options to a stressor and any fine-grained analysis of coping would require supplemental measures (Amirkhan, 1990).

Additional psychometric evaluation of the CSI in other samples and countries is needed, in order to examine its cross-cultural structure and its validity across a range of settings. As the four-factor solution has not been extensively confirmed by other studies, further examination of avoidance coping strategies will be very useful. Finally, future studies must examine the sociodemographic variables affecting the selection of a certain coping strategy in different cultural contexts.

References

- Ager, A. & Maclachlan, M. (1998). Psychometric properties of the Coping Strategy Indicator (CSI) in a study of coping behaviour amongst Malawian students. *Psychology & Health*, 13(3), 399-409.
- American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders* (4th ed). Washington, DC: Author, pp.31-32.
- Amirkhan, J. H. (1990). A factor analytically derived measure of coping: The Coping Strategy Indicator. *Journal of Personality and Social Psychology*, 59, 1066-1075.
- Amirkhan, J.H. (1994). Criterion validity of a coping measure. *Journal of Personality Assessment*, 62, 242-261.
- Arbuckle, J. (2012). *AMOS 21 reference guide*. Meadville, PN: Amos Development Corporation.
- Baqutayan, SMS. (2015). Stress and Coping Mechanisms: A Historical Overview. *Mediterranean Journal of Social Sciences*, 6(2), 479-488.
- Beauducel, A., & Wittmann, WW. (2005). Simulation study on fit indices in confirmatory factor analysis based on data with slightly distorted simple structure. *Structural Equation Modelling: A Multidisciplinary Journal*, 12(1), 41-75.
- Bijttebier, P. & Vertommen, H. (1997). Psychometric properties of the Coping Strategy Indicator in a Flemish sample. *Personality and Individual Differences*, 23(1), 157-160.
- Byrne, BM. (2001). *Structural equation modelling with AMOS: Basic concepts, applications, and programming*. Mahwah, NJ: Erlbaum.
- Clark, KK., Bormann, CA., Cropanzano, RS., & James, K. (1995). Validation evidence for three coping measures. *J Pers Assess.* 65(3), 434-455.
- Desmond, DM., Shevlin, M., & MacLachlan, M. (2006). Dimensional analysis of the Coping Strategy Indicator in a sample of elderly veterans

- with acquired limb amputations. *Personality and Individual Differences*, 40(2), 249-259.
- Fischer, J. & Corcoran, K. (1994). *Measures for clinical practice. A sourcebook. Volume 2. Adults.* (2nd edition). New York, The Free Press.
- Folkman, S., & Lazarus, RS. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health & Social Behavior*, 21, 219-239.
- Folkman, S., & Lazarus, RS. (1985). If it changes it must be a process: study of emotion and coping during three stages of a college examination. *Journal of Personality & Social Psychology*, 48, 150-170.
- Folkman, S., & Moskowitz, JT. (2004). Coping: Pitfalls and Promise. *Annual Review of Psychology*, 55, 745-774.
- Garyfallos, G., Karastergiou, A., Adamopoulou, A., Moutzoukis, C., Alagiozidou, E., Mala, D., & Garyfallos, A. (1991). Greek version of the General Health Questionnaire: Accuracy of translation and validation. *Acta Psychiatrica Scandinavica*, 84, 371-378.
- Goldberg, DP. & Hillier, VF. (1979). A scaled version of the General Health Questionnaire. *Psychol Med.* 9(1), 139-145.
- Goldberg, DP. (1978). *Manual of the General Health Questionnaire*, Windsor: NFER-Nelson.
- Heckathorn, DD. (1997). Respondent-driven sampling: A new approach to the study of hidden populations. *Social Problems*, 44, 174-199.
- Hu, L. & Bentler, P. (1999). Cut-off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1-55.
- Law, HG., Wilson, E. , & Crassini, Boris (1979). A principal components analysis of the Rathus Assertiveness Schedule. *Journal of Consulting and Clinical Psychology*, 47(3), 631-633.
- Litman, G. (2006). The COPE inventory: Dimensionality and relationships with approach- and avoidance-motives and positive and negative traits. *Personality and Individual Differences*, 41, 273-284.
- Ptacek, JT., Smith, RE., Espe, K., & Raffety, B. (1994). Limited correspondence between daily coping reports and retrospective coping recall. *Psychological Assessment*, 6(1), 41-49.
- Rathus, S. (1973). A 30-item schedule for assessing assertive behavior. *Behavior Therapy*, 4(3), 398-406.
- Robinson, RG. & Price, TR. (1982). Post-stroke depressive disorders: a follow-up study of 103 patients. *Stroke*, 13(5), 635-641.
- Roth, S., & Cohen, LJ. (1986). Approach, avoidance, and coping with stress. *American Psychologist*, 41, 813-819.
- Scientific Advisory Committee of Medical Outcomes Trust. (2002). Assessing health status and quality of life instruments: Attributes and review criteria. *Quality of Life Research*, 11(3), 193-205.
- Theofilou, P. (2015). Translation and cultural adaptation of the Multidimensional Scale of Perceived Social Support for Greece. *Health Psychol Res.* ; 3(1), 1061.
- Tsitsas, G., Theodosopoulou, M. & Malikiosi-Loizou, M., (2003). Rathus Assertiveness Schedule. In Stalikas, A., Triliva, S., Roussi, M. *The psychometric tools in Greece*, Athens, Ellinika Grammata.
- Zimet, G., Dahlem, N., Zimet, S., & Farley, G. (1988). The Multidimensional scale of perceived social support. *Journal of Personality Assessment*, 52:30-41.