Dyadic Coping in an Eastern European Context: Validity and Measurement Invariance of the Romanian Version of Dyadic Coping Inventory

Measurement and Evaluation in
Counseling and Development
1–12

© The Author(s) 2016

Reprints and permissions:

sagepub.com/journalsPermissions.nav

DOI: 10.1177/0748175616664009

mec.sagepub.com

Petruta P. Rusu^{1,2}, Peter Hilpert³,
Maria N. Turliuc⁴, and Guy Bodenmann¹

Abstract

This study investigates the psychometric properties of the Romanian version of the Dyadic Coping Inventory with data from 510 married couples. The results confirm the theoretical factorial structure of the Dyadic Coping Inventory for both partners, indicating convergent validity, discriminate validity, and measurement invariance (across genders and across cultures).

Keywords

family process, family resources, family strengths, relationship evaluation

Stress and coping processes in couples have increasingly been studied in North America and Western Europe. Previous studies not only demonstrated that stress occurring outside of the relationship (hereafter external stress; e.g., daily hassles, work stress) often spills over into the couple relationship (Bodenmann, 2005) but also that the negative impact on marriage may be buffered by a couple's coping behavior at the dyadic level (i.e., dyadic coping; Revenson & Lepore, 2012; Rusu, 2012).

Evidence suggests that dyadic coping has a protective influence on marital quality, marital stability, and partners' well-being (Fife, Weaver, Cook, & Stump, 2013), illustrating the relevance of dyadic coping in marital interactions. A recent meta-analysis (Falconier, Jackson, Hilpert, & Bodenmann, 2015) on more than 17,000 participants indicated that dyadic coping strongly predicts marital satisfaction for both men and women regardless of gender, age, relationship length, education level, and nationality.

However, all these findings are based on samples from North America and Western Europe. Falconier et al. (2015) suggest that more studies on dyadic coping should be conducted with participants from non-Western cultures. Some items of the Dyadic Coping Inventory (DCI) have already been used in a cross-cultural study (Hilpert et al., 2016), and the results indicate that dyadic coping seems to be a better predictor of marital satisfaction for Eastern European couples than for Western couples. Thus, more validated measures are needed in couple research for future studies in Eastern European contexts.

¹University of Zurich, Zurich, Switzerland

²"Ștefan cel Mare" University of Suceava, Suceava, Romania

³University of Washington, Seattle, WA, USA

⁴"Al. I. Cuza" University, Iași, Romania

Corresponding Author:

Petruta P. Rusu, Department of Educational Sciences,
Ștefan cel Mare University of Suceava, Universitatii 13,
720229, Suceava, Romania.

Email: petrutarusu@usv.ro

Consequently, the purpose of the current study is to validate the DCI in the Eastern European country of Romania.

The Theoretical Background of Dyadic Coping: The Systemic Transactional Model

The systemic-transactional model (STM; Bodenmann, 2005) views dyadic coping as a systemic concept, where stress and coping are understood as a dynamic interaction between the stress signals of one partner and the dyadic coping reactions of the other. In the STM, the dyadic coping process is conceptualized as a multidimensional concept.

First, five behavioral aspects of dyadic coping are differentiated, if one member of the couple undergoes stress: (1) *Stress Communication* (SC), which represents the verbal or nonverbal communication of the stress to the partner; (2) *Emotion-focused Supportive Dyadic Coping* (emotion-focused SDC), which involves supportive behaviors such as empathy and understanding with the goal of supporting the stressed partner; (3) *Problem-focused Supportive Dyadic Coping* (problem-focused SDC), which involves behaviors such as finding solutions or reframing the problem in order to support the stressed partner; (4) *Delegated Dyadic Coping* (DDC), which subsumes behaviors such as taking over the tasks of the stressed partner in order to reduce his/her burden; and (5) *Negative Dyadic Coping* (NDC), which comprises negative behaviors such as hostile behavior (criticizing or minimizing the partner's stress), ambivalent behavior (unmotivated or insufficient support), and superficial behavior (insincere or vague support). Each of these behaviors are assessed by both the actor (i.e., own behavior) as well as by the partner (i.e., perception of partner's behavior).

Second, if both members of the couple experience common relationship external stress (e.g., financial problems, problems with family of origin, child upbringing), two behavioral aspects are differentiated: (1) *Emotion-focused Common Dyadic Coping* (emotion-focused

CDC), which includes the sharing of feelings and relaxing together, and (2) *Problem-focused Common Dyadic Coping* (problem-focused CDC), which represents the common seeking of information and solutions.

The DCI and Validation Studies

In order to assess these behavioral aspects of the STM, a self-report inventory was developed (Bodenmann, 2008), allowing participants to rate all the proposed behavioral aspects: SC, emotion-focused SDC, problem-focused SDC, DDC, and NDC (the first five dimensions each for oneself and partner) and emotion-focused CDC and problem-focused CDC (the second two dimensions of CDC).

All DCI validation studies thus far, published in different languages (German, English, Italian, French, Spanish, and Portuguese), have reported a four- or five-factor structure for oneself and partner evaluations and different structures for CDC. In the German validation study (Bodenmann, 2008), a four-factor structure was found for the self-rated and the partner-rated behavior (SC, SDC, DDC, and NDC), and a one-factor structure was found for CDC. Both structures were confirmed by the DCI validation studies in the Italian, French, and Spanish samples (Ledermann et al., 2010). The DCI English validation on Canadian students (Levesque, Lafontaine, Caron, & Fitzpatrick, 2014) indicated five coping factors for one's own and partner's dyadic coping and a one-factor solution for CDC. In another Italian validation study (Donato et al., 2009), a five-factor solution was reported for the self-rated and the partner-rated behavior (splitting the SDC scale into emotion and problem-focused) and a three-factor solution for CDC (problem-focused, seeking closeness, and relaxation). The validation studies in Spanish and Portuguese (Falconier, Nussbeck, & Bodenmann, 2013; Vedes, Nussbeck, Bodenmann, Lind, & Ferreira, 2013) reported the same five-factor solution for the DCI by oneself and by partner and a two-factor solution for CDC (problem- and emotion-focused). The DCI comprises very good validity in all these studies.

Thus far, measurement invariance (MI) has not yet been tested for the DCI. Establishing MI, however, is crucial to demonstrate that the items of the instrument measure the same construct (Vandenberg & Lance, 2000). In the current study, we examine three levels of MI for DCI: *configural invariance* (same factor structure across groups); *metric invariance* (same factor loadings across groups), which is crucial for cross-cultural studies allowing to examine associations across groups/cultures; and *scalar invariance* (same items intercepts across groups), allowing to compare means across groups/cultures.

Method

Sample and Procedure

A total of 510 married Romanian couples ($N = 1,020$ individuals) participated in the current study. Couples were recruited from eight different counties of Romania, and all couples agreed to participate in the study. Men's mean age was 39.0 years ($SD = 9.3$, range = 21–66 years), and women's mean age was 36.1 years ($SD = 9.2$, range = 19–64). On average, couples were married for 13.0 years ($SD = 9.1$; range = 0.3–39 years). Couples had between zero and five children, with a mean of 1.46 ($SD = 1.0$). Six percent of women and 4% of men passed middle school, 35% of women and 30% of men passed high school, 12% of women and 15% of men passed post-high school, 38% of women and 43% of men had a bachelor degree, and 9% of women and 8% of men had a postgraduate degree. Students from a public Romanian university were involved in the data collection. They distributed the questionnaires to married couples. Both partners filled in the questionnaires independently at home and returned them separately in enclosed envelopes. The participation in the study was voluntary and couples were not reimbursed.

Swiss Sample. In order to test MI across cultures, we used a sample of 368 Swiss couples ($N = 736$ individuals; men's age = 49.3, $SD = 18.3$; women's age = 47.3, $SD = 18.4$; average

relationship duration 21, $SD = 17.88$). Swiss couples were recruited through advertisements in newspapers and on the radio for participating in a study on the impact of stress on couple relationships. Interested couples filled in a set of self-report measures at home and other two sets of questionnaires at the laboratory. In the current study, we used only participants' reports on the DCI (Bodenmann, 2008), which was completed at the laboratory. Participants were reimbursed for their participation in the study with 100 Swiss Francs (\$108).

Measures

Participants completed *demographic information* (age, gender, relationship duration, marriage duration, number of children, education, and living conditions).

The Dyadic Coping Inventory (Bodenmann, 2008) is a self-report inventory with 37 items, measured on a 5-point Likert-type scale (1 = *very rarely* to 5 = *very often*). The DCI assesses SC (e.g., own SC: "I tell my partner openly how I feel and that I would appreciate his/her support"); emotion-focused SDC (e.g., own: "I show empathy and understanding to my partner"); problem-focused SDC (e.g., partner: "My partner helps me analyze the situation so that I can better face the problem"); DDC (e.g., own: "When my partner feels he/she has too much to do, I help him/her out"); NDC (e.g., partner: "My partner does not take my stress seriously"); emotion-focused CDC (e.g., "We help each other relax with such things like massage, taking a bath together, or listening to music together"); and problem-focused CDC (e.g., "We try to cope with the problem together and search for ascertained solutions"). The first four scales (SC, SDC, DDC, and NDC) can be grouped into two aggregated scales (DC by Oneself and DC by Partner). In addition, *Evaluation of DC Scale* (Items 36 and 37) measures partner's satisfaction with their DC. Table 2 shows Cronbach's α for all the DCI subscales for both genders.

Couples Satisfaction Index (CSI 32; Funk & Rogge, 2007) is a 32-item questionnaire designed to measure how satisfied an

individual is within his/her current relationship (Funk & Rogge, 2007). Items were rated on a 6- and 7-point Likert-type scale (e.g., "I still feel a strong connection with my partner"). These items demonstrated excellent internal consistency (Cronbach's $\alpha = .97$ for men and $\alpha = .97$ for women).

The Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski, Kraaij, & Spinhoven, 2002) was also used. The positive reappraisal (focuses on attributing a positive meaning to the event in terms of personal growth, e.g., "I think that the situation also has its positive sides") and catastrophizing (thoughts of explicitly emphasizing the terror of what a person has experienced, e.g., "I often think that what I have experienced is the worst that can happen to a person") subscales were administered to evaluate discriminant validity of DCI. CERQ is a 36-item questionnaire, consisting of nine subscales, each referring to what someone thinks after experiencing threatening or stressful events. Cronbach's alpha values for positive reappraisal subscale is $\alpha = .75$ for men and $\alpha = .71$ for women; for the catastrophizing subscale $\alpha = .72$ for both men and women.

The scales used in the current study were first translated into Romanian and back-translated into English. Two native speakers of the Romanian language translated the English versions of the DCI, CSI, and CERQ into the Romanian language, and two professionals translated it back into English. The back-translation procedure showed good consistency with the original English version of the scales. The Swiss sample completed the DCI in German language.

Statistical Analyses

We conducted confirmatory factor analyses (CFA) to examine the hypothesized factorial structure if one person undergoes stress (five factors) and if the couples face the same stressor (two factors). We used common fit indices to test model to data fit: chi-square test (χ^2), comparative fit index (CFI), the standardized root mean square residual (SRMR), and the root mean square residual of approximation

(RMSEA). Common fit indices were used for structural equation modelling (Schermelleh-Engel, Moosbrugger, & Müller, 2003). Because χ^2 is too sensitive to large sample size, we rely on the rule of thumb that χ^2/df should be smaller than 3 (Schermelleh-Engel et al., 2003). We used the bootstrap method for correlations and paired samples *t* test to compute descriptives and the robust maximum likelihood estimator (MLR) to account for the nonnormally distribution subscales.

MI Across Gender. In order to test for MI across gender, we followed Verhofstadt, Buysse, Rosseel, and Peene's (2006) approach. First, an individual data set has to be created, and therefore, the sample was randomly split into two equally sized subsamples. Second, men's values were selected from the first subsample and women's values from the second subsample. Combining these subsamples provided an independent data set. Third, based on this new data set we tested the multigroup CFA for goodness of fit indices. To avoid that this procedure is based on selection of the subsamples, we repeated the procedure 1,000 times analyzing the mean of the overall fit indices. To test differences between the nested models of invariance, we calculated ΔCFI , considering that a model is invariant if it not decreases with a CFI value greater than .01 (Cheung & Rensvold, 2002).

MI Across Cultures. Considering that DCI was originally developed in Switzerland, we used a sample from Switzerland to test MI across Romanian and Swiss couples.

The statistical software R was used for all analyses (RStudio, 2012). R is a free and open source software for statistical computing and graphics. R is conceptualized to use specific packages, covering a wide range of modern statistics (e.g., multilevel modelling, Bayesian statistic). For computing CFAs in the current study, we used lavaan, a package for structural equation modelling, focused on latent variable analysis, including factor analysis (Rosseel, 2012). For resampling and MI we used semTools package in R, which provides useful tools for structural equation modelling

Table 1. Goodness of Fit Indices for the Confirmatory Factor Analyses of Dyadic Coping by Oneself and by Partner and for Common DC for Men's and Women's Report.

	Men's reports						Women's reports					
	χ^2	df	p	CFI	SRMR	RMSEA	χ^2	df	p	CFI	SRMR	RMSEA
<i>DC by Oneself and by Partner</i>												
Model 1												
Oneself	241.22	80	.00	.91	.05	.06 (.05–.07)	253.05	80	.00	.90	.05	.06 (.05–.07)
Partner	301.59	80	.00	.89	.05	.07 (.06–.08)	235.66	80	.00	.92	.05	.06 (.05–.07)
Model 2												
Oneself	155.94	55	.00	.945	.04	.06 (.04–.07)	130.68	55	.00	.95	.03	.05 (.04–.06)
Partner	1077.91	55	.00	.934	.04	.06 (.05–.07)	145.30	55	.00	.954	.04	.05 (.04–.06)
Model 3												
Oneself	102.93	44	.00	.96	.03	.05 (.03–.06)	96.83	44	.00	.95	.03	.04 (.03–.06)
Partner	102.64	44	.00	.96	.04	.05 (.03–.06)	98.81	44	.00	.96	.04	.04 (.03–.06)
<i>Common DC</i>												
Model 4	136.77	5	.00	.89	.05	.22 (.19–.26)	4.01	5	.54	1	.02	.00 (0–.05)
Model 5	16.66	4	.00	.98	.01	.07 (.04–.12)	9.89	4	.04	.96	.01	.05 (.009–.09)

Note. DC = dyadic coping; CFI = comparative fit index; SRMR = standardized root mean square residual; RMSEA = the root mean square residual of approximation.

(Pornprasertmanit, Miller, Schoemann, & Rosseel, 2013).

Results

Factor Structure of the DCI Subscales if One Partner Undergoes Stress

Fit indices of the hypothesized five-factor model did not show an acceptable fit of the data, neither for men nor for women, nor for oneself or partner (see Table 1) due to two items from the stress-communication subscale (Item 2, "I ask my partner to do things for me when I have too much to do," and Item 3, "I show my partner through my behavior when I am not doing well or when I have problems"). Standardized factor loadings for self-perceptions and for partner-perceptions are illustrated in Figure 1. Taking into consideration the low factor loadings of Item 2 ($\alpha = .38$ for men and $\alpha = .62$ for women) and Item 3 ($\alpha = .39$ for men and $\alpha = .52$ for women), and their residual correlations with other items, these two items were excluded from both Stress Communication by Oneself (Items 2 and 3) and from Stress Communication by Partner (Items 17 and 18).

The second model fitted the data better but the fit was still not acceptable for men's dyadic coping by partner. Further examination of the model indicated that Item 24 ("I listen to my partner and give him/her space and time to communicate what really bothers him/her") is not correlated with Items 20 and 21. Consequently, we dropped Item 24 from the emotion-focused SDC (by oneself) and its correspondent Item 9 from the emotion-focused SDC (by partner). The final model without these items (Model 3) showed a good model to data fit for all scales, for men and women, by oneself and by partner (see Table 1).

Factor Structure If Both Partners Undergo a Common Stressor

Fit indices show a very good fit of the data for the two-factor model of CDC (Model 5) for women and an acceptable fit of the data for men (Table 1). Model 5, a two-factor solution for CDC (problem focused and emotion focused), fit the data better than Model 4, a one-factor solution (see Table 1). This result is comparable with the findings of the Spanish and the Portuguese validation studies (Falconier et al., 2013; Vedes et al., 2013).

Table 2. DCI Subscales Means, Standard Deviations, Internal Consistency, and Paired Samples *t* Test (*N* = 1,020).

Subscales and aggregated scales	Women			Men			Paired samples <i>t</i> test
	<i>M</i>	<i>SD</i>	α	<i>M</i>	<i>SD</i>	α	
Stress Communication (O)	3.59	0.72	.65	3.40	0.78	.72	-4.91**
Stress Communication (P)	3.45	0.68	.68	3.60	0.70	.67	4.58**
Emotion-focused SDC (O)	4.11	0.66	.77	3.98	0.77	.83	-3.54**
Emotion-focused SDC (P)	3.92	0.86	.85	3.98	0.82	.83	1.83
Problem-focused SDC (O)	3.57	0.75	.51	3.49	0.75	.52	-2.07
Problem-focused SDC (P)	3.54	0.86	.72	3.56	0.79	.63	0.75
Negative DC (O)	1.98	0.77	.71	2.04	0.81	.74	1.89
Negative DC (P)	2.12	0.76	.65	2.09	0.75	.62	-1.01
Delegated DC (O)	3.58	0.78	.63	3.59	0.81	.72	0.37
Delegated DC (P)	3.52	0.95	.79	3.52	0.84	.64	0.19
Emotion-focused CDC	3.59	1.24	.51	3.63	1.00	.85	0.86
Problem-focused CDC	4.09	0.78	.90	4.00	0.79	.91	-2.57*
Evaluation of DC	3.97	0.89	.94	4.07	0.84	.92	3.32**
Total score DC (O)	3.79	0.52	.84	3.68	0.54	.82	-4.84**
Total score DC (P)	3.66	0.59	.87	3.74	0.54	.84	3.47**
Total score CDC	3.89	0.86	.80	3.86	0.80	.90	-0.95
Total score of DC	3.73	0.53	.93	3.73	0.53	.93	-0.95

Note. DCI = Dyadic Coping Inventory; O = oneself; P = partner; DC = dyadic coping; SDC = supportive dyadic coping; CDC = common dyadic coping. Bold values signify significant differences at $p < .05$ (*) and $p < .01$ (**).

Descriptive Statistics

Table 2 presents means, standard deviations, and Cronbach's alpha coefficients for all subscales and aggregated scales of dyadic coping. Table 2 also shows the results of the gender comparison. Women reported higher SC scores by oneself than men and men reported correspondingly that their wives used SC more frequently. Furthermore, wives reported a significantly higher perception of the emotion-focused supportive dyadic coping by oneself, dyadic coping by oneself (total score), and problem-focused common dyadic coping than husbands. Husbands scored significantly higher on the evaluation of dyadic coping, and dyadic coping by the partner (total score) than wives. Table 3 indicates that all correlation coefficients between DCI subscales are significant ($-.45 < |r_{\text{women}}| < .71$; $-.41 < |r_{\text{men}}| < .71$) except the correlation between SC by oneself and NDC by the partner ($r = -.03$).

The internal consistency of the DCI subscales and aggregated scales was in general good. In two subscales, the Cronbach's

alpha coefficients seem to be low (problem-focused SDC by oneself $\alpha = .51$ for women and $\alpha = .52$ for men; emotion-focused CDC for women $\alpha = .51$). But because these scales only comprise two items, the Cronbach α is equivalent with the correlation of these two items and $r > .50$ indicates a high correlation.

Construct Validity

Construct validity represents the degree to which an operationalization reflects its intended construct. In order to analyze the construct validity of the DCI, we tested convergent validity and discriminant validity.

Convergent Validity. Convergent validity represents to what extent theoretically related constructs are also empirically related. Our results showed that positive DCI subscales and aggregated scales were significantly positively correlated with relationship satisfaction ($.27 < |r_{\text{women}}| < .73$; $.30 < |r_{\text{men}}| < .69$), while negative DC was significantly negatively

Figure 1. Constrained standardized factor loadings for men's and women's DC for a five-factor model (by Oneself and by Partner) and a two-factor model for Common DC.

Note. DC = dyadic coping. All factor loadings are statistically significant at the .05 level.

correlated with relationship satisfaction ($-.50 < |r_{\text{women}}| < -.46$; $-.45 < |r_{\text{men}}| < -.38$). These findings indicated that DCI subscales converge with the related construct relationship satisfaction (Table 3).

Discriminant Validity. Discriminant validity represents to what extent theoretically unrelated constructs are empirically unrelated. In

order to test the discriminant validity of DCI, we analyzed the correlations between DCI subscales and two individual coping subscales (a functional individual coping strategy, positive reappraisal, and a dysfunctional strategy, catastrophizing). Table 4 shows that positive DCI subscales and aggregated scales are low to medium positively correlated with positive reappraisal ($.20 < |r_{\text{women}}| > .37$; $.14 < |r_{\text{men}}| > .30$)

Table 3. Correlations Between DCI Subscales.

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Stress Communication (O)		.49	.44	.64	.41	.57	.29	.57	-.28	-.21	.45	.53	.52
2. Stress Communication (P)	.44		.45	.45	.45	.43	.45	.41	-.20	-.13	.38	.45	.39
3. Emotion-focused SDC (O)	.39	.48		.61	.51	.49	.40	.47	-.45	-.37	.47	.58	.57
4. Emotion-focused SDC (P)	.43	.47	.63		.43	.65	.31	.66	-.40	-.40	.52	.63	.70
5. Problem-focused SDC (O)	.30	.45	.48	.43		.46	.46	.42	-.25	-.22	.39	.56	.42
6. Problem-focused SDC (P)	.47	.46	.50	.59	.44		.28	.70	-.32	-.32	.46	.59	.59
7. Delegated DC (O)	.28	.49	.52	.40	.54	.33		.30	-.12	-.12	.29	.38	.30
8. Delegated DC (P)	.44	.41	.43	.48	.34	.61	.35		-.30	-.34	.45	.50	.57
9. Negative DC (O)	-.12	-.15	-.41	-.38	-.21	-.27	-.22	-.21		.65	-.34	-.39	-.43
10. Negative DC (P)	-.03	-.13	-.32	-.32	-.17	-.24	-.15	-.14	.59		-.35	-.37	-.44
11. Emotion-focused CDC	.38	.43	.54	.54	.47	.50	.46	.46	-.45	-.29		.60	.62
12. Problem-focused CDC	.43	.47	.68	.65	.54	.55	.53	.48	-.46	-.30	.69		.71
13. Evaluation DC	.38	.45	.60	.68	.38	.55	.47	.47	-.44	-.36	.66	.71	

Note. DCI = Dyadic Coping Inventory; CDC = common dyadic coping; DC = dyadic coping; O = by oneself; P = by partner; SDC = supportive dyadic coping. White cells indicate correlations between variables in the male reports; light gray cells indicate correlations between variables in the female reports; all significant correlations are bold. Correlation is significant at the .01 level (2-tailed).

Table 4. Correlations of the DCI Scales With CSI and CERQ.

DCI	CSI		Positive reappraisal		Catastrophizing	
	Men	Women	Men	Women	Men	Women
Stress communication (O)	.30	.44	.14	.21	.13	-.04
Stress communication (P)	.31	.32	.26	.23	.04	.05
Emotion-focused SDC (O)	.56	.55	.22	.30	.03	-.12
Emotion-focused SDC (P)	.61	.65	.24	.21	-.08	-.12
Problem-focused SDC (O)	.33	.36	.30	.37	.02	.05
Problem-focused SDC (P)	.50	.52	.22	.28	.04	-.04
Negative dyadic coping (O)	-.45	-.46	-.06	-.09	.18	.26
Negative dyadic coping (P)	-.38	-.50	-.12	-.11	.25	.28
Delegated dyadic coping (O)	.38	.27	.21	.24	.01	.09
Delegated dyadic coping (P)	.41	.51	.26	.22	.11	-.01
Emotion-focused CDC	.58	.50	.27	.20	-.02	-.03
Problem-focused CDC	.64	.60	.28	.29	-.04	-.07
Evaluation of DC	.69	.73	.20	.22	-.07	-.13
Total score DC (O)	.59	.61	.24	.31	-.01	-.12
Total score DC (P)	.61	.67	.30	.28	-.07	-.12
Total score of DCI	.67	.69	.30	.31	-.04	-.12

Note. DCI = Dyadic Coping Inventory; CSI = Couples-Satisfaction Index; CERQ = Cognitive Emotion Regulation Questionnaire; O = own; P = partner; SDC = supportive dyadic coping; CDC = common dyadic coping; DC = dyadic coping.

and low correlated with catastrophizing ($-.13 < |r_{\text{women}}| < .09$; $-.08 < |r_{\text{men}}| < .13$), while negative DC was negatively correlated with positive reappraisal ($-.11 < |r_{\text{women}}| < -.09$; $-.12 < |r_{\text{men}}| < -.06$) and positively correlated with catastrophizing ($.26 < |r_{\text{women}}| < .28$; $.18 < |r_{\text{men}}| < .25$). Our findings support the discriminant validity of DCI. The DCI subscales and aggregated scales have a higher correlation with marital satisfaction than with individual coping strategies, supporting the construct validity of DCI.

Measurement Invariance

MI Across Gender. The fit indices support configural invariance across gender for DC by oneself, $\chi^2(44) = 97.09$, CFI = .97, and for DC by partner, $\chi^2(95) = 157.59$, CFI = .96. Configural invariance of CDC was supported by a very good CFI value (.98) but the χ^2/df was higher than 3, $\chi^2(4) = 36.04$. This can be based on the fact that the two-factor structure for CDC fit the data better for women than for men (Table 1). But because the fit indices

support the two-factor structure of CDC (Table 1, Model 5) for both men and women in general, we decided to continue to test metric and scalar invariance. Second, we tested metric invariance constraining factor loadings to be equal across gender. The results show that the change in CFI between the configural invariance and metric invariance model was not significant, indicating metric invariance for all DC scales across gender ($\Delta\text{CFI} < .01$). In the third model for testing scalar invariance, the equality of the factor loadings were maintained and additionally we constrained the item intercepts to be equal across gender. The nonsignificant difference between the scalar and metric invariance models suggested that scalar invariance holds across gender for all DC scales ($\Delta\text{CFI} < .01$).

MI Across Cultures. Preliminary CFAs conducted separately on the Romanian and Swiss data sets confirmed the five-factor solution of the DCI in each country. The fit indices support configural invariance for DC by oneself across cultures (for men: $\chi^2[88] = 163.13$,

CFI = .97; and for women: $\chi^2[88] = 172.83$, CFI = .96), indicating an equivalent five-factor solution of DCI in the Romanian and Swiss data sets. In order to test metric invariance in a second model, the factor loadings were constrained to be equal across cultures. The difference between the metric invariance model and the configural invariance model was nonsignificant for men and for women for all DC scales ($\Delta\text{CFI} < .01$), supporting metric invariance of DCI across cultures. In the final step, we tested the scalar invariance model (with both factor loadings and item intercepts set as equals across cultures), but the model showed a deterioration in fit statistics relative to the model of metric invariance for both male and female DC by oneself, for female DC by partner and for female CDC ($\Delta\text{CFI} > .01$). However, this model showed a nonsignificant decrease for male DC by partner and for male CDC ($\Delta\text{CFI} < .01$), supporting scalar invariance for this two DC scales.

Discussion

The main aim of the current study was to examine the psychometric properties and validity of the Romanian version of the DCI. As assumed, the factorial structure found in the current study is in line with other validation studies of the DCI in different languages (Italian, Portuguese, Spanish), indicating that the DCI measures dyadic coping reliably and validly in the Romanian population. By excluding three items, each by oneself and by partner, our findings support a 31-item version of DCI, with a five-factor structure if one person undergoes stress and a two-factor structure if both undergo a common stressor. This finding is equivalent to the findings of the Spanish validation study (Falconier et al., 2013) and with Italian and French validation studies.

The construct validity of DCI is supported by the results from convergent and discriminant validity. Correlations between dyadic coping and marital satisfaction subscales obtained in our study are consistent with the results of the validation of DCI versions in German, French, Italian, Spanish, and Portuguese

(Falconier et al., 2013; Ledermann et al., 2010; Vedes et al., 2013).

We found differences between men's and women's engagement in dyadic coping. Women reported significantly higher scores on stress communication and total dyadic coping compared with men. This could be determined by traditional gender roles in Romanian couples, where women are considered to be responsible for family care and housekeeping, whereas men are considered to be the head of the family and to be responsible for financial security (Robila, 2004). Regarding gender differences, our results are consistent to those reported in the DCI Spanish validation study (Falconier et al., 2013), Latino men reporting a higher total score of their partner's dyadic coping than Latino women.

The results from tests of measurement invariance demonstrated support for factorial invariance of DCI across gender and across cultures. The scalar MI of DCI across gender shows us that DCI evaluates the same construct for men and women and that any difference between Romanian men and women can be interpreted as being determined from true differences in dyadic coping scales rather than the instrument is measuring different constructs across gender. The scalar MI for male DC by partner and male CDC and the metric MI across cultures for all the other DCI scales allows us to use DCI in cross-cultural studies and to analyze the relationships between DCI subscales and other related constructs (e.g., marital satisfaction) across Romania and Switzerland.

Strengths and Limitations

There are important strengths in the design and methodological approach of our study (e.g., using MLR for CFA, bootstrap methodology, the sample size, testing MI across gender, and cultures), which increase our confidence in the results. Nevertheless, the current study comprises a number of limitations including self-report measures and the lack of test-retest reliability. Future research should include longitudinal research, evaluate the test-retest reliability, and predict the validity of the DCI.

Conclusion

The DCI version proposed in this study represents a basis for evaluating the way Romanian couples deal with stress. The validated scale can be used for future research: Systematic research on couples' stress and coping behavior in Romanian couples needs to be conducted in order to provide knowledge to develop cultural specific couple distress prevention programs.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

- Bodenmann, G. (2005). Dyadic coping and its significance for marital functioning. In T. Revenson, K. Kayser, & G. Bodenmann (Eds.), *Couples coping with stress: Emerging perspectives on dyadic coping. Decade of behavior* (pp. 33–50). Washington, DC: American Psychological Association.
- Bodenmann, G. (2008). *Dyadisches Coping Inventar (DCI). Test manual* [Dyadic Coping Inventory (DCI). Test manual]. Bern, Switzerland: Huber & Hogrefe.
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 9, 233–255. doi:10.1207/S15328007SEM0902_5
- Donato, S., Iafate, R., Barni, D., Bertoni, A., Bodenmann, G., & Gagliardi, S. (2009). Measuring dyadic coping: The factorial structure of Bodenmann's Dyadic Coping Questionnaire in an Italian sample. *Testing, Psychometrics, Methodology in Applied Psychology*, 16, 25–47. doi:10.1037/0893-3200.20.3.485
- Falconier, M. K., Jackson, J. B., Hilpert, P., & Bodenmann, G. (2015). Dyadic coping and relationship satisfaction: A meta-analysis. *Clinical Psychology Review*, 42, 28–46.
- Falconier, M. K., Nussbeck, F., & Bodenmann, G. (2013). Dyadic coping in Latino couples: Validity of the Spanish version of the Dyadic Coping Inventory. *Anxiety, Stress & Coping*, 26, 447–466. doi:10.1080/10615806.2012.699045
- Fife, B. L., Weaver, M. T., Cook, W. L., & Stump, T. T. (2013). Partner interdependence and coping with life-threatening illness: The impact on dyadic adjustment. *Journal of Family Psychology*, 27, 702–711. doi:10.1037/a0033871
- Funk, J. L., & Rogge, R. D. (2007). Testing the ruler with item response theory: Increasing precision of measurement for relationship satisfaction with the Couples Satisfaction Index. *Journal of Family Psychology*, 21, 572–583. doi:10.1037/0893-3200.21.4.572
- Garnefski, N., Kraaij, V., & Spinhoven, P. H. (2002). *Manual for the use of the Cognitive Emotion Regulation Questionnaire*. Leiderdorp, Netherlands: DATEC.
- Hilpert, P., Randall, A. K., Sorokowski, P., Atkins, D. C., Sorokowska, A., Ahmadi, K., . . . Błażejewska, M. (2016). The associations of dyadic coping and relationship satisfaction vary between and within nations: A 35-nation study. *Frontiers in Psychology*, 7, 1106.
- Ledermann, T., Bodenmann, G., Gagliardi, S., Charvoz, L., Verardi, S., Rossier, J., . . . Iafate, R. (2010). Psychometrics of the Dyadic Coping Inventory in three language groups. *Swiss Journal of Psychology/Schweizerische Zeitschrift für Psychologie/Revue Suisse de Psychologie*, 69, 201–212. doi:10.1024/1421-0185/a000024.
- Levesque, C., Lafontaine, M.-F., Caron, A., & Fitzpatrick, J. (2014). Validation of the English version of the Dyadic Coping Inventory. *Measurement and Evaluation in Counseling and Development*, 47, 215–225. doi:10.1177/0748175614522272.
- Pornprasertmanit, S., Miller, P., Schoemann, A., & Rosseel, Y. (2013). *semTools: Useful tools for structural equation modeling: R package version 0.4-0*. Retrieved from <http://CRAN.R-project.org/package=semTools>
- RStudio. (2012). RStudio: Integrated development environment for R (Version 0.96.122) [Computer software]. Boston, MA: Author. Retrieved from <http://www.rstudio.org/>
- Revenson, T. A., & Lepore, S. J. (2012). Coping in social context. In A. Baum, T. A. Revenson, & J. Singer (Eds.), *Handbook of health*

- psychology (2nd ed., pp. 193–217). New York, NY: Psychology Press.
- Robila, M. (2004). Child development and family functioning within Romanian context. In M. Robila (Ed.), *Families in Eastern Europe* (pp. 141–154). New York, NY: Elsevier.
- Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software*, 48, 1–36. Retrieved from <http://www.jstatsoft.org/v48/i02/>
- Rusu, P. P. (2012). *Religiosity and religious coping in couple and family relations: Therapeutical implications* (Unpublished doctoral dissertation). “Al. I. Cuza” University of Iasi, Iași, Romania.
- Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online*, 8(2), 23–74.
- Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods*, 3(1), 4–70. doi:10.1177/109442810031002
- Vedes, A., Nussbeck, F. W., Bodenmann, G., Lind, W., & Ferreira, A. (2013). Psychometric properties and validity of the Dyadic Coping Inventory in Portuguese. *Swiss Journal of Psychology*, 72, 149–157. doi:10.1024/1421-0185/a000108
- Verhofstadt, L. L., Buysse, A., Rosseel, Y., & Peene, O. J. (2006). Confirming the three-factor structure of the quality of relationships inventory within couples. *Psychological Assessment*, 18(1), 15–21. doi:10.1037/1040-3590.18.1.15

Author Biographies

Petruta Rusu is lecturer at Stefan cel Mare University of Suceava, Romania. She was awarded a post-doctoral fellowship in 2013 to conduct research at the Department of Clinical Psychology: Children/Adolescents & Couples/Families, University of Zurich, Switzerland. Her specialization is in couple and family psychology with an emphasis on individual and contextual variables related to stress and coping in couples, family religiosity and family economic strain.

Peter Hilpert obtained his Ph.D. in Clinical Psychology from the University of Zurich. Currently, he is postdoc at the Department of Psychiatry and Behavioral Science, University of Washington. His research interests include dyadic coping and co-regulation processes during couple interactions using a computational approach.

Maria N. Turliuc is professor of Psychology and coordinator of a master program in Couple and Family Therapy at “Al. I. Cuza” University of Iasi, Romania. Her research interests are related to couple and family psychology with an emphasis on women discrimination, psychological trauma and family resilience.

Guy Bodenmann is professor of Clinical Psychology at the University of Zurich. He is the director of the Clinical Training Program for Psychotherapy in Children and Adolescents, director of the Clinical Training Program for Couple Therapy and director of the postgraduate training for school psychology. He is well known for his research on stress and coping in couples, the development of the Systemic Transactional Stress and Coping Model and the development of the Couples Coping Enhancement Training (CCET).