

Structural equation analyses of personality, appraisals, and coping relationships

ALIJA KULENOVIĆ and VESNA BUŠKO

The study deals with the hypothesized mediating effects of cognitive appraisals on stressfulness of the event in the personality, stress, and coping processes. The relationships between personality measured by NEO-FFI questionnaire, perceived stressfulness of the event, and situation-specific coping measures, were analyzed in a prospective framework with 421 basic military trainees. Analyses of linear structural models partially supported the hypotheses of Lazarus transactional theory on the central mediating role of cognitive appraisal of stress intensity in the relationships between stable antecedents and the ways of coping. Mediating effects of perceived event stressfulness were fully demonstrated for the measure of 'emotion-focused coping' at the beginning of basic training, whereas the latent coping factor of the 'acceptance of situation' proved to be practically independent of the appraised stressfulness. The tested models were the most successful in explaining the variance of emotion-focused coping (64% and 51% at the 1st and 2nd time point, respectively). The models accounted for 24% and 35% of problem solving coping, whereas the acceptance of situation was rather poorly explained by the models (10% of variance in both time points). The results suggest that personality dimensions have a more pronounced and direct contribution to the coping variance at the end of basic training than in prediction of measures of initial coping.

Key words: personality traits, cognitive appraisals, coping, mediating hypothesis, structural equation models

An enormous body of literature has been accumulated on how individual efforts to manage distressing problems shape physical and psychological outcomes of stress. Much has been learned so far about some aspects of stress and adaptational processes. Research has shown, for instance, that coping behaviors are influenced by individual attributes, like personality traits and allied personal resources (e.g., Costa, Somerfield, & McCrae, 1996; Crowley, Hayslip, & Hobdy, 2003; David & Suls, 1999; DeLongis & Holtzman, 2005; Kraaij, Garnefski, & Maes, 2002; Lee-Baggley, Preece, & DeLongis, 2005; Stanton, Danoff-Burg, & Huggins, 2002; Suls & David, 1996; Terry, 1994; Terry, Tonge, & Callan, 1995). There is also substantial evidence that the nature, role and structure of coping are dependent upon situational factors, and stressor controllability, in particular (e.g., Buško, & Kulenović, 1995, 1997, 2001b, 2003a,

2003b; Chang, 1998; DeLongis & Holtzman, 2005; Endler, Speer, Johnson, & Flett, 2000; O'Brien, & DeLongis, 1996; Park, Armeli, & Tennen, 2004; Skinner, Edge, Altman, & Sherwood, 2003; Terry & Hynes, 1998; Valentiner, Holahan, & Moos, 1994, etc.). As several critics argue, apparently less is known, however, about the more fundamental questions on how coping processes function, and also on its role in adaptation to stress, that is, whether or to what extent coping matters (e.g., Beutler & Moos, 2003; Coyne & Racioppo, 2000; Marlowe, 2003; Stanton, Danoff-Burg & Huggins, 2002).

The majority of researchers in this area acknowledge the contextual and dynamic view of the constructs of stress and coping, as postulated by yet the most influential Lazarus transactional theory (Lazarus, 1993, 2000; Lazarus & Folkman, 1987). As is well known, the theory views the processes of appraisals and coping as critical mediators of an unfavorable person-environment relationship and various immediate and long-term outcomes. Coping is regarded as a shifting process in which a person must, at certain times, rely more heavily on one strategy and at other times on some other forms of coping as the status of person-environment relationship changes (Lazarus, 1993, 2000; Lazarus & Folkman, 1987). As within other contextual approaches, more transient situation-based factors are assumed to shape one's choices of coping responses. Furthermore, the cognitivist perspective of Lazarus theory holds that subjective appraisals of situations are the key determinants of coping efforts employed.

Vesna Buško, Department of Psychology, Faculty of Humanities and Social Sciences, Luciceva 3, 10000 Zagreb, Croatia. E-mail: vbusko@ffzg.hr (the address for correspondence).

Preliminary version of this paper [Buško, V. & Kulenović, A. (2003a): Personality and coping with a low-control situation: The mediating role of cognitive appraisals] was presented at 13th Biennial Meeting of the IS-SID, Graz, Austria, 13-17.07.2003. The paper is a part of the research project "Measuring latent psychological attributes: Person dispositions and processes" supported by Croatian Ministry of Science, Education, and Sports.

Hence, according to the Lazarus model, adequate predictions on how individuals will manage a specific stressful circumstance cannot be made without considering the unique adaptive demands of the situation and the associated cognitive appraisals individuals use in interpreting the personal meaning of those demands. On the other hand, stable personal, social, or environmental influences, regarded as antecedents of coping responses, are expected to have just an indirect role in this process, by influencing the way a person appraises the situational demands.

This cognitive and contextual view of the constructs of stress and coping, however, seems to be challenged in works by several authors shifting the emphasis from subjective appraisals to the role of more objective resources in the stress process (e.g., conservation of resources theory; Hobfoll, 2001), and suggesting variations in adaptive value of coping with moderating situational factors (e.g., Holahan, Moos, & Schaefer, 1996). Despite vast empirical evidence on the role of objective or perceived situational attributes in the choice or frequency of use of coping strategies, considerable inter-individual variations certainly exist in response to almost any life situation. As different authors agree (e.g., Costa, Somerfield & McCrae, 1996; David & Suls, 1999; David, Suls, & Harvey, 1996; Moos & Schaefer, 2003; Watson & Hubbard, 1996), in most cases there are alternative ways of dealing with stressors, and the choice of coping strategies depends as on personal preferences so on specific situational demands.

The relationships between stable personality dispositions and behavior in particular stressful situations seem to remain among the most controversial issues in the area of conceptualization and research on coping. Unlike Lazarus transactional theory, several other approaches include conceptions on coping dispositions, or styles, describing one's tendency to use specific coping strategies in different types of stressful situations (Carver & Scheier, 1994; Costa, Somerfield & McCrae, 1996; Endler, Speer, Johnson & Flett, 2000; Hudek-Knežević, Kardum, & Kalebić-Maglica, 2005; Watson & Hubbard, 1996, etc.). In support of dispositional concepts, different authors refer to findings on stability of coping styles (see e.g., Costa, Somerfield & McCrae, 1996; Hewitt & Flett, 1996). Yet, there are several reasons why the data on stability are of rather limited value when drawing inferences on coping consistency. These include methodological issues such as stressor heterogeneity in sample data on which stability coefficients are based, time intervals specified for the choice of stressful event and also for the self-reports on coping, variations in usual administration of coping measures, etc. (see e.g. Buško, 2000, for a more detailed account). Similar methodological problems apply also to a substantial amount of research on personality and coping relationships. Nevertheless, observed consistency and stability in coping responses seem to be attributable in part to stable personality influences (Carver, Scheier, & Weintraub, 1989; Costa, Somerfield & McCrae, 1996; Lee-Bagglely, Preece & DeLongis, 2005; Buško & Kulenović, 2004a, 2004b; Moos & Holahan, 2003; Terry, 1994; Watson & Hubbard, 1996, etc.).

Regardless of the theoretical position behind a study of stress processes, an extensive body of research demonstrates the significant role of personality in the choice of the ways of coping with stressful circumstances. Out of broad personality dimensions, neuroticism was by far most often examined. Persons high on neuroticism have generally been found to use more passive or emotion-focused strategies, and less problem-focused coping (e.g. Carver, Scheier & Weintraub, 1989; David & Suls, 1999; Lee-Bagglely, Preece & DeLongis, 2005; Watson & Hubbard, 1996). The role of extraversion in coping seems to be less clear, however, research suggests that this dimension is related to higher levels of problem-focused coping and the use of more adaptive forms of emotion-focused coping (David & Suls, 1999; Lee-Bagglely, Preece & DeLongis, 2005; Watson & Hubbard, 1996), as well as generally more active, socially oriented ways of coping (Costa et al., 1996; Matthews, Saklofske, Costa, Deary, & Zeidner, 1998; Parkes, 1986). The available data on other broad personality dimensions are much more sparse. The existing evidence though points to potential importance of these dimensions and their relations to stress and coping processes in theoretically meaningful ways (David & Suls, 1999; DeLongis & Holtzman, 2005; Hewitt & Flett, 1996; Lee-Bagglely, Preece & DeLongis, 2005; Vickers, Kolar, & Hervig, 1989; Watson & Hubbard, 1996).

Based on various empirical findings, different authors suggest that in prediction of coping, these stable individual and environmental resources, along with situational factors, should also be taken into account - as separate and independent sources of influence (Holahan, Moos & Schaefer, 1996; Moos & Holahan, 2003). Such a viewpoint has already been stated by Parkes within an additive approach to coping (Parkes, 1986). There is also empirical evidence suggesting that the importance of coping and its adaptive value may vary considerably with moderating contextual factors, such as stressor controllability (e.g. Valentiner, Holahan, & Moos, 1994). As noted previously, valid inferences on the relationships between coping and other hypothesized elements in the stress process, e.g. personality or outcome indices, require an adequate control of situational factors, that is, the sources of stress. Moreover, testing the hypotheses on the dynamic nature of these phenomena, including the role of stable personal attributes in the stress process, implies follow-up studies on people as similar as possible with regard to the kind of situations they encounter.

In this study we aimed to test the hypothesis on the mediating effects of stress appraisals in the analysis of relationships between personality and coping with specific continually stressful life circumstances. Situational context of the research was defined by stressors related to obligatory military service. The situational framework of military service is characterized by (1) rather high adaptive demands especially during basic military training, (2) high level of similarity of potential sources of stress for all recruits, and (3) typically low level of control over events and their outcomes (Buško & Kulenović, 2001a). These features seemed

to make the military context especially suitable for testing the hypotheses on the processes of stress and coping. The relationships among personality, cognitive appraisals and coping were examined with the coping strategies assessed at the beginning and the end of basic military training.

METHOD

Sample and procedure

The sample consisted of 421 male participants serving regular training in one of the Croatian military basic training centers. Age of participants varied in range from 18-27 years ($M = 21$, $SD = 2.59$), and the dominant education level was complete secondary school (78%). The study was done in two waves and the results reported here are based on data collected on the sample of trainees who took part in both parts of the study (approximately 94% of the original sample). The first part was completed at the very beginning of their military service, i.e. within 7-12 days of their stay in the Centre. The follow-up was done 5 weeks later, i.e. in the second last week of their military basic training. The only criterion for the selection of participants was basic literacy. Participants had the option to withdraw from the study at any time; however, no one refused to take part in the follow-up nor gave up during data collection. Selected set of instruments was administered in groups of 60-80 subjects. Data gathering procedure was identical in the two measurement points and lasted approximately 90 minutes per group including a short break.

Instruments

Personality. Croatian version of NEO Five Factor Inventory (NEO-FFI; Costa & McCrae, 2005) was administered for the assessment of five broad personality dimensions. The NEO-FFI is a short form of the revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 2005) and contains five 12-item scales measuring each of the five factors or domains of personality. Items are rated on a 5-point scale from "strongly disagree" to "strongly agree", with total scores on each scale ranging from 0 to 48. Cronbach-alpha internal consistency coefficients obtained in the first time point of this study ($N = 445$) are .76 for Neuroticism (N), .69 for Extraversion (E), .57 for Openness (O), .54 for Agreeableness (A), and .76 for Conscientiousness (C).

Cognitive appraisal. Appraisal of event stressfulness, that is, primary cognitive appraisal in terms of Lazarus theory, was measured by two 6-item scales of emotions reflecting threat and loss appraisals, respectively. Items were rated on a four point scale from "not at all" to "very much" with reference to the selected sources of stress while in the military. Total scores on each scale are computed as the average

score on respective items, varying in theoretical range from 0-3. Cronbach-alpha internal consistencies are .81 and .83 for the Threat and Loss appraisals, respectively.

Coping. For the purposes of this study, the following 9 situation-specific 4-item coping scales were used (Cronbach-alpha coefficients are given in parentheses for the 1st and 2nd time point, respectively): *Negotiation* ($\alpha_1 = .42$; $\alpha_2 = .57$) - including active strategies directed at other persons related to the problem; asking for advice, but also confronting; *Planning* ($\alpha_1 = .60$; $\alpha_2 = .58$) - mainly cognitive efforts aimed at finding a solution to the problem; *Active accommodation* ($\alpha_1 = .60$; $\alpha_2 = .59$) - taking concrete, practical actions aimed at better handling the situation; *Avoidance* ($\alpha_1 = .44$; $\alpha_2 = .50$) - describing cognitive or behavioral attempts to avoid or escape from the situation; *Passivization* ($\alpha_1 = .41$; $\alpha_2 = .49$) - giving up from the attempt to directly resolve the problem, accepting the situation; *Reinterpretation* ($\alpha_1 = .62$; $\alpha_2 = .69$) - containing efforts directed at creating predominantly positive meaning to a stressful event; *Expression of emotions* ($\alpha_1 = .57$; $\alpha_2 = .68$) - open expression of emotions, venting of feelings; *Wishful thinking* ($\alpha_1 = .65$; $\alpha_2 = .67$) - describing day-dreaming, desires about the change or disappearance of the source of stress; *Seeking social support* ($\alpha_1 = .48$; $\alpha_2 = .54$) - turning to other people and close persons, asking for emotional support. Subjects were to appraise how often they used each presented strategy in previously selected stressful situations (1 = not at all, 4 = often). Scores on each coping scale are computed by summing the answers on corresponding items, varying in theoretical range from 4-16.

RESULTS

Analyses of linear structural models using LISREL 8.7 (Jöreskog & Sörbom, 1996) statistical package were done to examine the nature of relationships among personality dimensions, stress appraisals measures, and coping assessed at the first and second time point, respectively. Two hypothetical structural models were tested and compared on each data set, one of which allowed only for indirect paths between personality and coping variables through cognitive appraisals, and the other one contained direct along with indirect links between personality and ways of coping.

The analyses were based on covariance matrices of 5 personality scales and 2 stress appraisal variables (administered at the first time point), and 9 coping scales (administered at the first and second time point, respectively), with Maximum Likelihood as an estimation method. Within specification of the basic statistical model to be tested against the data, five personality scales were defined as manifest exogenous variables, whereas cognitive appraisal and coping variables served as indicators of respective endogenous latent variables.

Measurement models of coping used in this study were specified following the results of confirmatory factor analy-

ses on the latent structure of coping, based on same sets of scale-level coping data (see Buško & Kulenović, 2003b, for detailed account). Accordingly, factor (1) *problem solving* was defined by Planning, Negotiation, and Seeking social support; (2) *emotion-focused coping* was represented by Wishful thinking, Expression of emotions, and Avoidance, and (3) *acceptance of situation* by variables Active accommodation, Reinterpretation, and Passivization. The fourth latent variable in the measurement model, aimed to assess appraised *event stressfulness* or *primary cognitive appraisals*, was defined by two indicators, Threat and Loss appraisal scales.

As mentioned previously, two alternative structural models of the relationships among personality, appraisal, and coping constructs were specified for each data set. First model (1) was defined following Lazarus transactional views on the central mediating role of cognitive appraisal processes in the relationships between personal antecedents and ways of coping. Hence, the model specifies the paths between each personality variable and the latent stress appraisals measure, and between latent stress appraisals and each of the three latent coping measures. Alternative model (2) followed additive approach to coping postulating direct relationships of antecedent measures and coping processes. Along with indirect paths, this model includes also direct links describing contribution of personality variables in explaining each of the latent coping measures. In addition, parameters for covariance estimates among endogenous latent coping variables residuals were specified within each model.¹

Beside theoretical considerations, several statistical criteria were used to evaluate the adequacy of the specified structural equation models: (a) the χ^2 goodness-of-fit statistic; (b) χ^2/df ratio; and (c) the goodness-of-fit index (GFI), as an indicator of global model fit (Jöreskog & Sörbom, 1996). As a criterion for the choice of the better fitting model we used the difference in χ^2 values obtained for the alternative models. This was possible since the specified models were directly comparable, i.e., the model (1) is nested within model (2). This difference ($\Delta\chi^2$) was tested with Δdf (i.e. number of degrees of freedom is determined in this case as the difference between df pertaining to alternative models).

Main results of the analyses of fit of the tested structural models of the relationships of personality, appraisals, and coping variables at the beginning of military basic training are given in Table 1. Highly significant chi-squared values are obtained for both models, however model (2), allowing for indirect as well as direct paths from personality to cop-

ing variables showed significantly better fit to the data ($\Delta\chi^2 = 78.23$, $\Delta df = 15$, $p < .001$, GFI = .95) and, hence, served to calculate parameter estimates². Insignificant parameters produced by the better fitting model were further fixed to zero, and the final solution of this (reduced) structural equation model (2a) is presented in Figure 1.

The model accounted for 41% of *stress appraisal* variance, with the Neuroticism scale appearing as the strongest predictor of this latent variable (.53, $p < .001$). Also, the scores on Openness scale (.11, $p < .01$), as well as low Extraversion (-.12, $p < .05$) and Agreeableness scores (-.11, $p < .01$) showed less pronounced, albeit still statistically significant contributions to the appraised stressfulness. Furthermore, latent stress appraisals accounted for 64% of variance of *emotion-focused coping*, whereas personality measures obviously contribute just indirectly to the variance of this coping factor. Higher experienced stress is also followed by more frequent use of problem solving (.46, $p < .001$) and, as shown in Figure 1, a direct contribution to this coping factor was also found for Openness (.13, $p < .001$) and Conscientiousness (.27, $p < .001$). The model explained 24% of problem solving variance and no more than 10% of latent factor defined as *acceptance of situation*. The only variable found to contribute to the prediction of this coping mode was Conscientiousness scale (.31, $p < .001$).

When speaking of *emotion-focused coping* factor assessed at the beginning of basic training, the results described so far clearly support the hypothesis on the mediating role of the construct of primary cognitive appraisal in the relationships between personality traits as antecedent factors and the ways of coping with specific stressors. This applies to a considerable degree to the initial *problem solving* coping as well, whereas the *acceptance of situation* factor showed no relations with appraised stressfulness. The results for the latter latent variable, on the contrary, give more ground to the hypotheses on the direct relationships of personality and situation-specific ways of coping. It should be noted, however, that this coping factor was rather poorly explained by the tested structural model.

Analogous procedures for testing previously described alternative structural models were employed again with latent coping variables defined by indicators measured at the second time point. By use of data on personality and stress appraisals gathered at the beginning of military service, and the ways of coping by the end of basic training, we attempted to acquire more support for the inferences about the direction of relationships among the analyzed constructs. Main

¹ Correlations of *emotion-focused coping* with *problem solving* factor were .56 and .59, and with *acceptance of situation* -.02 and .10, for the first and second time point, respectively. Obtained correlations between *problem solving* and *acceptance of situation* were .50 and .44 (see Buško & Kulenović, 2003b).

² Tests of Multivariate normality performed on the sets of variables included in the study produced highly significant values. Although Maximum Likelihood method doesn't seem to be particularly sensitive to departures of distributions from normality, this fact along with relatively large sample size could probably account for eventual overestimations in the chi-square values obtained.

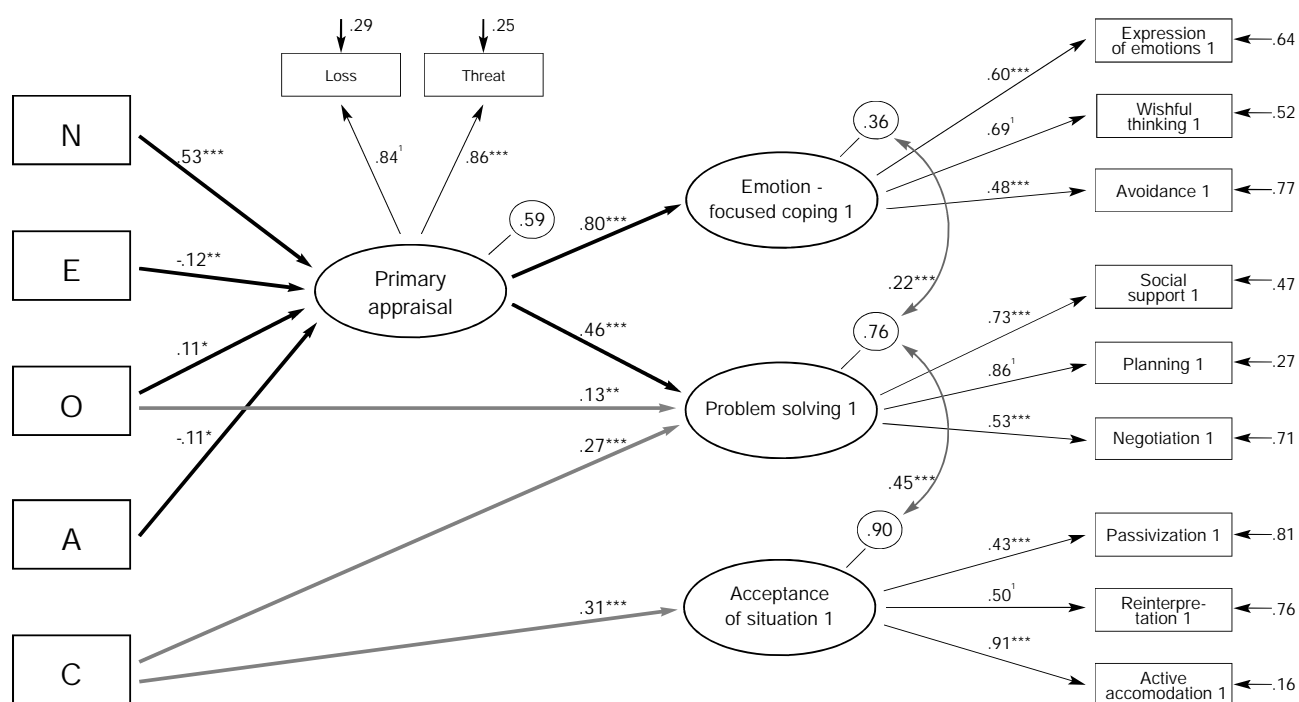


Figure 1. Model of relationships among personality variables, primary cognitive appraisal and coping at the beginning of basic training: standardized path coefficients (maximum likelihood estimates)

Note. N = Neuroticism; E = Extraversion, O = Openness, A = Agreeableness, C = Conscientiousness; 1 parameter estimates fixed to 1.0; * $p < .05$; ** $p < .01$; *** $p < .001$; Intercorrelations among personality variables, and parameters of correlated residuals for several pairs of coping indicators, are skipped for simplicity from the path diagram.

Table 1
Main Goodness-of-Fit Statistics: Models of relationships among personality, cognitive appraisals, and coping variables at the beginning of military basic training

Model	χ^2	df	χ^2/df	$\Delta\chi^2$	Δdf	p	GFI
(1)	272.28	84	3.2				.93
(2)	194.05	69	2.8	78.23	15	<.001	.95
(2a)	213.35	80	2.6	(19.30)	(11)	(ns)	.94

Table 2
Main Goodness-of-Fit Statistics: Models of relationships among personality, cognitive appraisals, and coping at the end of basic training

Model	χ^2	df	χ^2/df	$\Delta\chi^2$	Δdf	p	GFI
(1)	297.68	81	3.6				.92
(2)	185.06	66	2.8	112.62	15	<.001	.95
(2a)	190.40	73	2.6	(5.34)	(7)	(ns)	.95

results of the analyses of fit of the tested structural models are given in Table 2.

Chi-squared test produced statistically significant values in the analyses of the two longitudinally conceived models, as well. Again, model (2) allowing for indirect as well

as direct paths from personality to coping variables showed significantly better fit to the data ($\Delta\chi^2 = 112.62$, $\Delta df = 15$, $p < .001$) and, hence, served to calculate parameter estimates. Final solution of this structural equation model (2a) after fixing insignificant parameters to zero is presented in Figure 2.

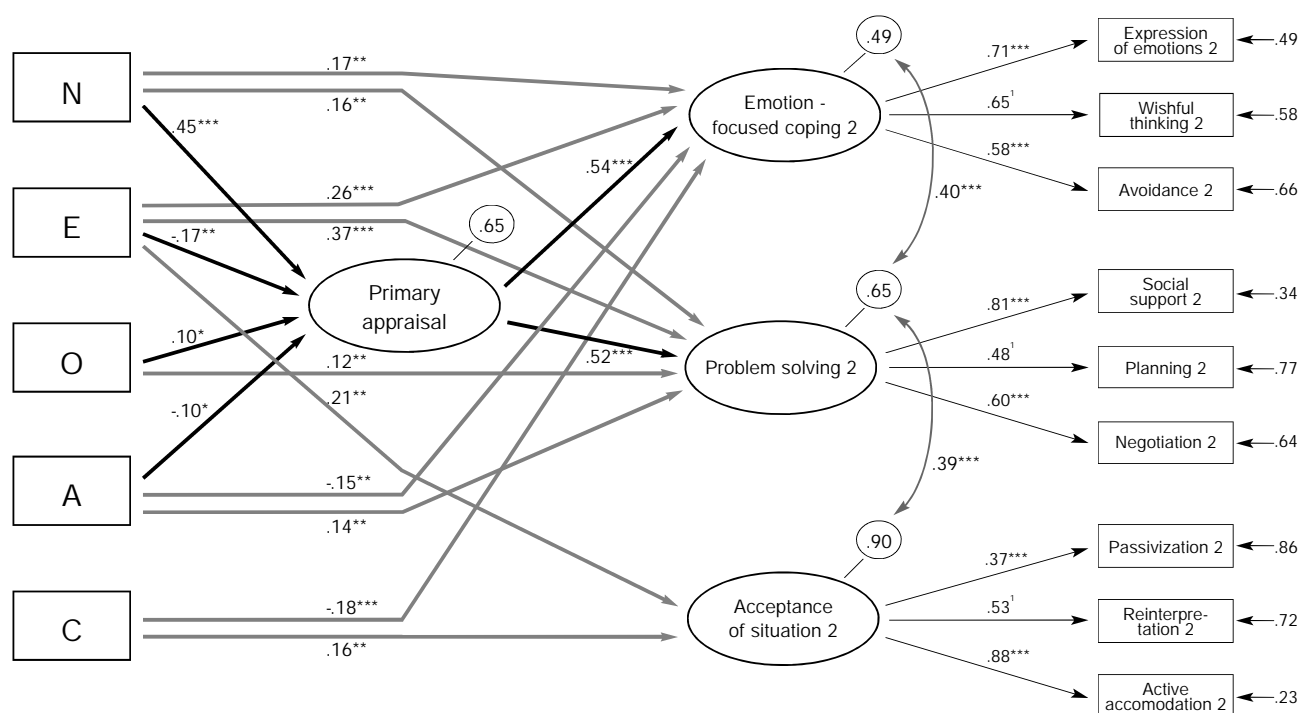


Figure 2. Model of relationships among personality variables, primary cognitive appraisal and coping at the end of basic training: standardized path coefficients (maximum likelihood estimates)

Note. N = Neuroticism; E = Extraversion, O = Openness, A = Agreeableness, C = Conscientiousness; ¹parameter estimates fixed to 1.0; * $p < .05$; ** $p < .01$; *** $p < .001$; Intercorrelations among personality variables, and parameters of correlated residuals for several pairs of coping indicators, are skipped for simplicity from the path diagram; two indicators defining Primary appraisal latent construct are identical to those in previous analyses, and hence also skipped for simplicity from the diagram.

As shown by parameter estimates, the specified model can explain 51% of *emotion-focused coping* variance and 35% of variance of *problem solving* factor. Stress appraisals at the beginning of service showed to be the strongest predictor of the two latent coping variables assessed at the second time point, as well (.54 and .52, $p < .001$, for emotion-focused and problem solving coping, respectively). Significant path coefficients obtained for the relations of personality scales with perceived stress (from -.17, $p < .01$, for Extraversion to .45, $p < .001$, for Neuroticism) speak of mediating effects of this latent variable on the use of emotion-focused and problem solving coping. Besides, independent contribution in accounting for latent measures of coping at the end of basic training was found for each of the personality variables. Direct effects were found for Neuroticism (.17, $p < .01$), Extraversion (.26, $p < .001$), Agreeableness (-.15, $p < .01$), and Conscientiousness (-.18, $p < .001$) on the use of *emotion-focused coping*, as well as for Extraversion (.37, $p < .001$), Neuroticism (.16, $p < .01$), Agreeableness (.14, $p < .01$), and Openness (.12, $p < .01$) on *problem solving*. As for the initial coping, the model is least effective in explaining the *acceptance of situation* variance (10%). Significant and positive direct contribution to the variance

of this factor was found just for Extraversion (.21, $p < .01$) and Conscientiousness (.16, $p < .01$) scales.

DISCUSSION

The study examined the nature of relationships between basic personality dimensions, cognitive appraisal of event stressfulness, and the ways of coping during military basic training. Findings support in part the basic hypotheses of Lazarus theory on the central mediating role of cognitive appraisal processes in the relationships between personal antecedents and the ways of coping in specific situations. Although the models allowing for both, direct and indirect effects of personality on coping proved to fit significantly better to the data, the mediating effects of latent stress appraisals are clearly demonstrated when speaking of *emotion-focused* and *problem solving* factors of coping. Moreover, theoretical expectancies (Lazarus, 2000; Lazarus & Folkman, 1987) are fully confirmed in case of emotion-focused coping assessed in the first time point. As shown in Figure 1, this latent variable is predicted exclusively by the measure of perceived stress, and the sign of the path coefficient is consistent with other findings on the positive relations of

appraised stress, threat and loss experiences with the more frequent use of avoidant and emotion-focused strategies (e.g., David & Suls, 1999; Losiak, 2001; Major, Richards, Cooper, Cozarely, & Zubek, 1998; Marlowe, 2003; Terry, 1994).

Although the opposite trend of relations of perceived stress with problem-focused strategies have also been found (e.g., Terry, 1994), the results on problem solving factor obtained in this study support findings on positive relations of primary cognitive appraisal measures with a number of functionally different strategies (e.g., Carver & Scheier, 1994; Chang, 1998; Parkes, 1986; Terry, 1994). One should, however, bear in mind relatively high correlations found between emotion-focused and problem solving latent dimensions (.56 and .59, for the first and second time point, respectively), suggesting that there is a considerable overlapping in their meanings or functions in the context of the stressors examined. Appraised stressfulness showed to be the strongest independent predictor of the two coping dimensions measured in both time points.

The use of coping described by *acceptance of situation* factor appeared, however, virtually independent from appraised stressfulness. Hence, the expectancies based on a range of empirical findings on stronger situational effects on instrumental compared to emotion-focused strategies are not supported by the results of our study (e.g. Mattlin, Wethington, & Kessler, 1990; Terry, 1994). This seems to be obvious at least for the model including initial coping measures (see Figure 1). As shown in Figure 1, personality dimensions contribute significantly and directly to the variance of problem solving and acceptance of situation, that is, dimensions of coping typically regarded and interpreted as instrumental or problem-focused ways of coping (Buško & Kulenović, 2003b; Carver & Scheier, 1994; Masel, Terry, & Gribble, 1996; Valentiner, Holahan & Moos, 1994; Terry & Hynes, 1998). On the one hand, it can be stated that these results speak in favor of additive view of coping determinants and processes (Hewitt & Flett, 1996; Moos & Holahan, 2003; Parkes, 1986; Terry, 1994). Still, there are seemingly more acceptable explanations for the findings. Namely, obtained path coefficient values and data on the amount of variance explained for each of the three latent coping dimensions, clearly show that the models employed are incomplete or considerably less efficient when dealing with problem solving, and acceptance of situation factor in particular, than in explaining the variance of emotion-focused coping.

Beside personal dispositions and primary appraisal measures there seems to be a number of other, obviously more important determinants of these coping dimensions. Potential determinants or correlates of problem-focused coping in the examined situational context possibly include actual or perceived environmental and/or situational features. In line with basic hypotheses of Lazarus theory and various empirical findings, it seems likely that the substantial role in accounting for the frequency of use of these strategies might

be attributed to actual and/or appraised event controllability, that is, real or perceived situation demands in general. Hypothesized effects of these determinants on coping might be independent or direct, mediated and/or interactive (e.g., David & Suls, 1999; DeLongis & Holtzman, 2005; Lee-Bagley, Preece & DeLongis, 2005; Parkes, 1986). For instance, research indicates that the importance of antecedents, including personality traits, in accounting for ways of coping, and active strategies in particular, is higher with high level of event controllability (Terry, 1994; Valentiner, Holahan & Moos, 1994). The use of problem-focused coping was also shown to be dependent primarily on the type, or situational content, whereas the strongest effects of stress appraisals were found for emotion-focused strategies (Terry, 1994).

Furthermore, the obtained direct relationships of personality to latent coping dimensions at the beginning and by the end of basic training warrant a commentary. The differences in outcomes of the two models concern mainly the parameters pertaining to this set of relationships (see Figures 1 and 2). The obtained path coefficients in the two models suggest that personality has a generally more important role when speaking of prediction of coping at the end of training as compared to the measures of initial coping. This finding is even more interesting having in mind that the former instance contains follow-up data.³

Direct contributions to later coping were found for each personality dimension, however, the abovementioned differences seem to be most evident for extraversion. Extraversion takes some part in accounting for the level of appraised stress, but not for coping at the first time point. At the end of training, though, this scale significantly and directly contributes to the prediction of each of the three latent coping dimensions. The necessity of considering the dynamic nature of the stress processes when studying the relationships between personality and coping has been emphasized repeatedly by many authors (DeLongis & Holtzman, 2005; Bolger & Zuckermann, 1995; Hewitt & Flett, 1996; Lazarus, 2000; Park, Armeli & Tennen, 2004; Somerfield & McCrae, 2000). Following interactionist views within personality area, as well as Lazarus dynamic view of stress and coping concepts, personality influences are expected to be evident in some phases of stressful encounters and less in some other phases. Hence, research designs enabling clear answers on whether and when personality matters in coping are warranted (Bolger & Zuckermann, 1995; Somerfield & McCrae, 2000). Our findings seem to support these notions.

Finally, the relationships found between particular personality and coping dimensions correspond for the most part with findings of other research. As shown by path

³ It is worth noting that the analyses using primary appraisal measures gathered in the second time point produce similar results. The results of these analyses can also be obtained on request from the second author.

coefficients (Figures 1 and 2), the strongest effects, though largely mediated by the measure of appraised stress, refer to the role of neuroticism in the choice of emotion-focused coping, which is among the most frequently cited findings in the study of personality and coping (e.g., Bolger & Zuckermann, 1995; Carver, Scheier & Weintraub, 1989; Costa, Somerfield & McCrae, 1996; David & Suls, 1999; Lee-Baggley, Preece & DeLongis, 2005; Watson & Hubbard, 1996). Unlike several findings on negative relations of neuroticism with problem-focused strategies (see e.g., David & Suls, 1999; Vickers, Kolar & Hervig, 1989), our results are in line with those of Bolger and Zuckermann (1995) showing that in interpersonal conflict situation high levels of neuroticism are followed by more frequent use of a range of ways of coping including playful problem solving and seeking social support.

The obtained positive relationships of extraversion with three factors of coping in the second time point support previous findings on a tendency of extraverts to use a variety of ways of coping (Lee-Baggley, Preece & DeLongis, 2005; Suls & David, 1996), including active problem solving, seeking social support, positive reappraisal, and also different emotion-focused strategies (Costa, Somerfield & McCrae, 1996; David & Suls, 1999; DeLongis & Holtzman, 2005; Parkes, 1986; Vickers, Kolar & Hervig, 1989). Also, significant positive relations of conscientiousness with problem-focused strategies, and negative with some emotion-focused strategies, were consistently found in several other studies (Vickers, Kolar & Hervig, 1989; Watson & Hubbard, 1996; Hudek-Knežević, Kardum & Kalebić-Maglica, 2005). And lastly, the obtained low but significant positive relations of openness to experience and agreeableness scales with problem solving factor appeared in other studies as well (DeLongis & Holtzman, 2005; Vickers, Kolar & Hervig, 1989; Watson & Hubbard, 1996).

In conclusion, it should be stated that the findings of this study apply primarily to stressful situations associated with regular military service and the population of young adult males. Nevertheless, resemblances in findings of our and other studies seem to give good reason for generalizations to other populations as well as other sources of stress, especially those characterized by typically low level of control over events and their outcomes.

REFERENCES

- Beutler, L. E., & Moos, R. H. (2003). Coping and coping styles in personality and treatment planning. *Journal of Clinical Psychology*, *59*, 1045-1047.
- Bolger, N., & Zuckermann, A. (1995). A framework for studying personality in the stress process. *Journal of Personality and Social Psychology*, *69*, 890-902.
- Buško, V., & Kulenović, A. (2004a). Latent change variable models in studying intraindividual variability in coping measures. Paper presented at *Applied Statistics*, <http://www.as2004.si/>.
- Buško, V., & Kulenović, A. (2004b). Multi-Construct Latent State-Trait Model of Coping with Low-Control Situations. Paper presented at 24th SMABS, Jena, <http://www.smabs.org/>.
- Buško, V. (2000). *Procesi suočavanja i kontinuirana izloženost stresorima [Coping processes and enduring exposure to stressors]*. Dissertation. Filozofski fakultet, Zagreb.
- Buško, V., & Kulenović, A. (1995). Coping with prison stress. *Review of Psychology*, *2*, 63-70.
- Buško, V., & Kulenović, A. (1997). Personal attributes and coping processes in explaining psychosomatic symptoms in prisoners. *Review of Psychology*, *4*, 15-23.
- Buško, V., & Kulenović, A. (2001a). Coping with stress during military basic training. *Changing Mission for the 21st Century: Proceedings of the 36th IAMPSS* (63-68). MORH, Zagreb.
- Buško, V., & Kulenović, A. (2001b). Depressive reactions as an outcome of stress processes: The study on imprisonment. *Društvena istraživanja*, *10*, 231-252.
- Buško, V., & Kulenović, A. (2003a). Personality and coping with a low-control situation: The mediating role of cognitive appraisals. Paper presented at 13th Biennial Meeting of the ISSID, Graz, Austria.
- Buško, V., & Kulenović, A. (2003b). The structure and stability of coping with low control stressors. *Review of Psychology*, *10*, 75-83.
- Carver, C. S., & Scheier, M. F. (1994). Situational coping and coping dispositions in a stressful transaction. *Journal of Personality and Social Psychology*, *66*, 184-195.
- Carver, C. S., Scheier, M. F. & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, *51*, 267-283.
- Chang, E. C. (1998). Dispositional optimism and primary and secondary appraisal of a stressor: Controlling for confounding influences and relations to coping and psychological and physical adjustment. *Journal of Personality and Social Psychology*, *74*, 1109-1120.
- Costa, P. T., & McCrae, R. R. (2005). *Priručnik za revidirani NEO inventar ličnosti (NEO PI-R) i NEO petofaktorski inventar (NEO-FFI)* [Revised NEO Personality Inventory (NEO PI-R) and NEO Five-Factor Inventory (NEO-FFI) Professional Manual] (M. Krizmanić, Trans.). Jastrebarsko: Naklada Slap. (Original work published 1992)
- Costa, P. T., Somerfield, M. R., & McCrae, R. R. (1996). Personality and coping: A reconceptualization. In M. Zeidner & N. S. Endler (Eds.), *Handbook of Coping: Theory, Research, Applications* (pp. 44-61). New York: John Wiley & Sons.
- Coyne, J. C., & Racioppo, M. W. (2000). Never the twain shall meet? Closing the gap between coping research and

- clinical intervention research. *American Psychologist*, 55, 655-664.
- Crowley, B. J., Hayslip, Jr., B., & Hobdy, J. (2003). Psychological hardiness and adjustment to life events in adulthood. *Journal of Adult Development*, 10, 237-248.
- David, J. P., & Suls, J. (1999). Coping efforts in daily life: Role of Big Five traits and problem appraisals. *Journal of Personality*, 67, 265-294.
- DeLongis, A., & Holtzman, S. (2005). Coping in context: The role of stress, social support, and personality in coping. *Journal of Personality*, 73, 1-24.
- Endler, N. S., Speer, R. L., Johnson, J. M., & Flett, G. L. (2000). Controllability, coping, efficacy, and distress. *European Journal of Personality*, 14, 245-264.
- Hewitt, P. L. & Flett, G. L. (1996). Personality traits and the coping process. In M. Zeidner & N. S. Endler (Eds.), *Handbook of Coping: Theory, Research, Applications* (pp. 410-433). New York: John Wiley & Sons.
- Hobfoll, S. E. (2001). The influence of culture, community, and the nested-self in the stress process: Advancing Conservation of Resources theory. *Applied Psychology*, 50, 337-370.
- Holahan, C. J., Moos, R. H., & Schaefer, J. A. (1996). Coping, stress resistance, and growth: Conceptualizing adaptive functioning. In M. Zeidner & N. S. Endler (Eds.), *Handbook of Coping: Theory, Research, Applications* (pp. 24-43). New York: John Wiley & Sons.
- Hudek-Knežević, J., Kardum, I., & Kalebić-Maglica, B. (2005). The sources of stress and coping styles as mediators and moderators of the relationship between personality traits and physical symptoms. *Review of Psychology*, 12, 91-101.
- Jöreskog, K., & Sörbom, D. (1996). *LISREL 8: User's reference guide*. Chicago: Scientific Software International.
- Kraaij, V., Garnefski, N., & Maes, S. (2002). The joint effects of stress, coping, and coping resources on depressive symptoms in the elderly. *Anxiety, Stress, and Coping*, 15, 163-177.
- Lazarus, R. S. (1993). From psychological stress to the emotions: A history of changing outlooks. *Annual Review of Psychology*, 44, 1-21.
- Lazarus, R. S. (2000). Toward better research on stress and coping. *American Psychologist*, 55, 665-673.
- Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Psychology*, 1, 141-169.
- Lee-Bagley, D., Preece, M., & DeLongis, A. (2005). Coping with interpersonal stress: Role of Big Five traits. *Journal of Personality*, 73, 1142-1180.
- Losiak, W. (2001). Can patterns of coping explain more? A study of coping and emotions in surgical stress. *Anxiety, Stress and Coping*, 14, 213-235.
- Major, B., Richards, C., Cooper, M. L., Cozarelly, C. & Zubek, J. (1998). Personal resilience, cognitive appraisals, and coping: An integrative model of adjustment to abortion. *Journal of Personality and Social Psychology*, 74, 735-752.
- Marlowe, N. (2003). Stressful Events, Appraisal, Coping and Recurrent Headache. *Journal of Clinical Psychology*, 59, 1107-1116.
- Masel, C. N., Terry, D. J. & Gribble, M. (1996). The effects of coping on adjustment: Re-examining the goodness of fit model of coping effectiveness. *Anxiety, Stress, and Coping*, 9, 279-300.
- Matthews, G., Saklofske, D. H., Costa, P. T., Jr., Deary, I. J., & Zeidner, M. (1998). Dimensional models of personality: A framework for systematic clinical assessment. *European Journal of Psychological Assessment*, 14, 36-49.
- Mattlin, J. A., Wethington, E., & Kessler, R. C. (1990). Situational determinants of coping and coping effectiveness. *Journal of Health and Social Behavior*, 31, 103-122.
- Moos, R. H., & Holahan, C. J. (2003). Dispositional and contextual perspectives on coping: Toward an integrative framework. *Journal of Clinical Psychology*, 59, 1387-1403.
- O'Brien, T. B., & DeLongis, A. (1996). The interactional context of problem-, emotion-, and relationship-focused coping: The role of Big Five personality factors. *Journal of Personality*, 64, 775-813.
- Park, C. L., Armeli, S., & Tennen, H. (2004). Appraisal-Coping Goodness of Fit: A Daily Internet Study. *Personality and Social Psychology Bulletin*, 30, 558-569.
- Parkes, K. R. (1986). Coping in stressful episodes: The role of individual differences, environmental factors, and situational characteristics. *Journal of Personality and Social Psychology*, 51, 1277-1292.
- Skinner, E. A., Edge, K., Altman, J., & Sherwood, H. (2003). Searching for the structure of coping: A review and critique of category systems for classifying ways of coping. *Psychological Bulletin*, 129, 216-269.
- Somerfield, M. R., & McCrae, R. R. (2000). Stress and coping research: Methodological challenges, theoretical advances, and clinical applications. *American Psychologist*, 55, 620-625.
- Stanton, A. L., Danoff-Burg, S., & Huggins, M. E. (2002). The first year after breast cancer diagnosis: Hope and coping strategies as predictors of adjustment. *Psycho-Oncology*, 11, 93-102.
- Suls, J., & David, J. P. (1996). Coping and personality: Third time's the charm? *Journal of Personality*, 64, 993-1005.
- Terry, D. J. (1994). Determinants of coping: The role of stable and situational factors. *Journal of Personality and Social Psychology*, 66, 895-910.

- Terry, D. J., & Hynes, G. J. (1998). Adjustment to a low-control situation: Reexamining the role of coping responses. *Journal of Personality and Social Psychology*, 74, 1078-1092.
- Terry, D. J., Tonge, L., & Callan, V. J. (1995). Employee adjustment to stress: The role of coping resources, situational factors, and coping responses. *Anxiety, Stress, and Coping*, 8, 1-24.
- Valentiner, D. P., Holahan, C. J., & Moos, R. H. (1994). Social support, appraisals of event controllability, and coping: An integrative model. *Journal of Personality and Social Psychology*, 66, 1094-1102.
- Vickers, R. R., Jr., Kolar, D. W., & Hervig, L. K. (1989). Personality correlates of coping with military basic training (Report No. 89-3). San Diego, CA: Naval Health Research Center.
- Watson, D., & Hubbard, B. (1996). Adaptational style and dispositional structure: Coping in the context of the Five-Factor model. *Journal of Personality*, 64, 737-774.