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## COPING MECHANISMS AS MEDIATORS IN THE RELATIONSHIP BETWEEN PERCEIVED STRESS AND PRECAUTIONS DURING THE COVID-19 PANDEMIC

The current COVID-19 pandemic represents an accidental crisis of global proportions that requires humanity to adaptively cope with unknown and low-control stressors. This research aimed to explore coping mechanisms by first considering them in the domain of their factor structure and then examining their mediating role in the relationship between stress perception and precautionary measures in the context of a pandemic. The sample included a total of 582 adult respondents from Serbia (75.7% female), with an average age of 38.74 years ( $SD = 10.48$ ). The Brief COPE (Coping Orientation to Problems Experienced) scale was used to measure coping mechanisms, the Perceived Stress Scale was used to assess the perception of the stress level, and the propensity to adhere to the prescribed precautions was examined with a scale constructed for the purpose of this study. The exploratory factor analysis extracted seven coping strategies. The first corresponded to problem-focused confrontation, the second referred to emotion-focused confrontation, three isolated dimensions were associated with avoidance coping strategies, while the functions of Humor and Religion could not be clearly defined. After conducting a higher-order factor analysis, two factors were singled out: the first, which combined problem-focused and emotion-focused coping, Humor, and Religion, and the second, which brought together mechanisms aimed at avoidance coping. The results of the hierarchical regression analysis suggested significant partial mediating effects of coping mechanisms. The first higher-order factor enhanced the effects of stress perception on the practice of precautionary behavior, while the second higher-order factor reduced these effects. The obtained results raise the question of adequacy of the standard coping mechanism measuring instruments in the assessment of stress caused by an accidental crisis and further question the possibility of an

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: adequate response to stressors that are unknown and poorly  
: controllable.

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## Introduction

Since the beginning of humanity, people have been striving to meet numerous goals set by various life challenges and struggling with attempts to adaptively overcome a diverse array of stressors. This almost axiomatic claim is seldom as true and ubiquitous as in global crisis situations, such as the current COVID-19 pandemic caused by the SARS-CoV-2 virus. This months-long crisis period is marked by traumatic experiences affecting individuals, families, and entire communities around the planet, and it is characterized by a further increased stress potential. The world's population is facing not only one, clearly defined and precisely limited major life change, but countless chronic consequences of the initial crisis event, from which it is impossible to escape. Accordingly, related but partially distinct psychological phenomena of stress, crisis, and trauma are equally present in the lives of the vast majority of people (Ajduković, 2000).

### Stress and Coping

According to contemporary theoretical conceptualizations of stress, when people encounter potentially stressful circumstances, they assess them, or more precisely, they rely on the operations of cognitive appraisal (Lazarus & Folkman, 2004; Tran et al., 2018). Cognitive appraisals are higher-order thought evaluation processes by which a person categorizes life experiences according to their meaning and importance. These assessments largely determine whether a particular event will be perceived as stressful (Kristofferzon et al., 2018). They are the reason for the existence of individual differences in all segments of the stress process – from the interpretation of possible stressors, through the quality and strength of distress, to the choice of mechanisms for coping with difficulties (Furman et al., 2018). The described phenomenon consists of two interconnected cognitive processes known as primary and secondary cognitive appraisal. In a specific stressful transaction, these processes can occur successively or simultaneously. Within the primary appraisal, individuals determine the significance of the current situation for their own general welfare and well-being (Devenport, 2012), while the secondary cognitive appraisal is used to analyze possible ways of combating the discomfort (Oláh, 2005). Depending on the primary cognitive appraisal, an individual can experience a specific event as a threat, loss or a challenge (Beer & Moneta, 2012; Lazarus, 1990; Mclean et al., 2007). The secondary cognitive appraisal serves to determine whether the stressor is controllable and what options are available to deal with it (Oláh, 2005).

Coping research has primarily dealt with ways in which people can reduce or even completely remove stressful experiences from their lives. Coping implies an action (or its absence as a special form of reaction) of cognitive or

behavioral nature that results in various emotional and motivational changes. Coping mechanisms serve to break, reduce or tolerate inconsistencies between an individual and her/his environment, with the aim of stopping the stress process (Snyder & Mann Pulvers, 2001). Lazarus and Folkman, the founders of the transactional theory of stress, define coping as “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman, 2004, p. 145). Thus, coping represents a crucial intervening variable. In a particular stressful transaction, it acts as a mediator in the relationship between the stimulus and the individual’s response (Heffer & Willoughby, 2017).

The proponents of more modern theories of stress believe that unlike the generally known dimensions of personality, coping cannot be defined as a stable characteristic of an individual, due to its procedural nature (Colodro et al., 2010; Lazarus & Folkman, 2004). Many studies have suggested that coping mechanisms lose their predictive power when they are operationalized as dimensions of personality. More specifically, they cannot reliably predict the consequences of stressful transactions (Lazarus & Folkman, 2004; Wang & Saudino 2001). In the present study, coping strategies were approached as situation-specific variables – the authors were interested in what respondents really think, feel, and do during a pandemic emergency (rather than what they usually do under stressful circumstances in general).

Coping mechanisms can be categorized according to their function, i.e., the purpose they serve. There are quite a few taxonomies of coping mechanisms that take function as the main criterion of division. One of the best-known classifications was offered by transactionalists. This widely accepted categorization distinguishes two large groups of coping strategies: problem-focused and emotion-focused (Furman et al., 2018; Lazarus & Folkman, 2004).

*Problem-focused coping strategies* involve a variety of thoughts and behaviors aimed at defining the problem, searching for alternative solutions, assessing those possibilities with respect to their expected outcomes, choosing a particular solution, and taking action (Zotović, 2004). Some problem-focused coping strategies are designed to effect objective changes in the external environment, such as lowering environmental pressures, securing the necessary resources, and removing various barriers. However, this category of coping mechanisms includes various cognitive processes by which a person tries to make certain intrapsychic changes, such as adjusting one’s aspirations to the given circumstances, seeking more adequate ways to satisfy needs and desires, and adopting new knowledge (Rani & Batra, 2015). According to the existing literature, problem-focused coping has two interrelated short-term goals: resolving the discrepancy that arises between the individual and the environment during a stressful transaction and indirectly reducing the intensity of distress (Genc et al., 2013).

*Emotion-focused coping* encompasses a variety of thoughts and behaviors aimed at changing the individual's unpleasant feelings. With these coping strategies, people do not change the objective stressful situation. Instead, they try to reduce or completely eliminate emotional pain by relying on a wide range of psychological mechanisms, such as minimization, denial, and selective attention (Lazarus & Folkman, 2004). Specific examples of coping actions focused on emotions include seeking emotional support, open expression of feelings, reliance on humor in order to divert attention from the problem, and positive reinterpretation of stressors (Genc, 2017).

Neither problem-focused nor emotion-focused coping strategies have an *a priori* defined value. Their effectiveness always depends on numerous contextual factors in a specific stressful transaction (Folkman, 1992). In everyday life, these two categories of confrontational actions are most often used simultaneously and they are not mutually exclusive (Kristofferzon et al., 2018). However, decades of empirical research have shown that there are certain circumstances under which one of the mentioned categories is dominantly used. Namely, problem-focused coping strategies are more commonly and successfully implemented in controllable situations, while the use of emotion-focused coping mechanisms is more prevalent in living conditions that an individual cannot change (Furman et al., 2018; Kristofferzon et al., 2018; Snyder, & Dinoff, 1999).

Critics of this widely accepted taxonomy of coping mechanisms have pointed out that the described categories are too broad and that they are not unambiguously demarcated and clearly separated. Furthermore, according to Compas et al. (1999), the classification, in fact, was not based on the functions of coping mechanisms but on the results of factor analyses. According to this author, a factor analysis only indicates the tendency of individual behaviors to occur at the same time. However, this method does not reveal anything about the exact intentions of the respondents. This is why there are numerous situations in which it is not possible to determine whether a certain behavior belongs to the group of problem-focused coping mechanisms or the category of emotion-focused coping strategies. For example, searching for information is most often considered a prototype of behavior that is focused on solving problems. However, this coping mechanism also has a significant emotional function: reducing fears and anxiety due to insufficient knowledge and uncertainty.

In order to describe coping behaviors that are not covered by the described categorization, some authors have added avoidance coping as a special category that implies conscious behavioral and/or cognitive avoidance and denial of the existence of the problem (Elliot et al., 2011; Kausar, 2017). These are palliative strategies, which can include denying and ignoring objectively existing difficulties in order to create the illusion of safety and security, seeking escape in the consumption of various psychoactive substances, and engaging in different kinds of self-handicapping behavior (Lacković-Grgin, 2004). According to the existing research, the correlations between avoidance,

problem-focused, and emotion-focused coping strategies are generally low and not statistically significant, which supports the independence of these three dimensions (Endler & Parker, 1990; Hudek-Knežević & Kardum, 2005; Parker & Endler, 1992).

Penley et al. (2002) conducted a comprehensive meta-analysis of 34 studies that investigated the relationships between different types of coping mechanisms and physical and mental health indicators. They found that individuals who predominantly used emotion-focused coping mechanisms, as well as avoidance coping, reported more frequent negative health consequences. The only exception was the strategy of positive reinterpretation of stressors, which was consistently positively associated with physical and mental well-being.

The work of Skinner et al. (2003) is possibly the best-known meta-analysis in this domain. In a thorough review of the existing theoretical models and coping questionnaires, the authors found more than 100 taxonomic systems and over 400 different names of coping dimensions. In order to form a smaller set of higher-order coping categories, they identified 12 "super-categories". The five categories that most frequently occur in the existing classifications are: problem-focused coping, support seeking, avoidance, distraction, and cognitive restructuring. The subsequent categories that are relatively commonly found in the literature include: rumination, helplessness, social withdrawal, and emotional regulation.

Among the best-known and most commonly used measuring instruments intended for coping assessment are the Ways of Coping Checklist (WCC, Folkman & Lazarus, 1980), the Ways of Coping Questionnaire (WCQ, Folkman & Lazarus, 1988), the Coping Orientation to Problems Experienced Scale (COPE, Carver et al., 1989), the Coping Inventory for Stressful Situations (CISS, Endler & Parker, 1990), and the Coping Strategy Indicator (CSI, Amirkhan, 1990). In a review of numerous exploratory and confirmatory factor analyses of both the abovementioned and other unmentioned measuring instruments, a ubiquitous trend emerged: they all manifested an extremely labile and non-replicable factor structure (Carpenter, 1992). In various samples, the WCC has proved to be an unstable instrument - some researchers have identified five factors (problem-focused, seeking social support, self-blame, fantasizing, and avoidance), others have identified six, while Parks found only three: a general tendency to use cognitive and behavioral strategies, direct confrontation, and suppression. Furthermore, those who have detected uninterpretable factors or unacceptably high intercorrelations between different subscales are not in the minority either (Lacković-Grgin, 2004). The WCQ has not fared much better on empirical tests. The lability of the factor structure has been found to be equally pronounced as with the previous instrument - the number and content of factors have varied from sample to sample and depending on the type of stressor assessed in a particular study (Hudek-Knežević & Kardum, 2005).

When defining the problem of the current research, the authors focused on the following segments of previously presented knowledge about stress

and coping mechanisms: 1) extensive meta-analytical studies of theoretical concepts and instruments for measuring coping have indicated a marked inconsistency of the existing taxonomies of coping mechanisms (Skinner et al., 2003); 2) coping is a crucial intervening variable that acts as a mediator in the relationship between the stimulus and the individual's reaction in a specific stress transaction (Heffer et al., 2017); 3) modern understandings of stress emphasize that it is more appropriate to approach coping as a phenomenon of a procedural nature than as a stable characteristic of an individual (Colodro et al., 2010). Accordingly, the current study first explored the latent space of one of the frequently used questionnaires for measuring coping mechanisms (Brief COPE) and then examined the mediating role of coping mechanisms in the relationship between perceived stress and precautionary behaviors in the context of the COVID-19 pandemic. Although the Brief COPE has shown very unstable factor structure, we have decided to use it in the current study because it covers 14 different coping strategies operationalized through relatively small number of items.

## Method

### Sample and Procedure

This study involved 582 adults from Serbia (75.7% female). The age of the participants ranged from 19 to 75 years, and the average age was 38.74 years ( $SD = 10.48$ ). The research has been approved by the Institutional Ethics Committee ([http://psihologija.ff.uns.ac.rs/etika/?odobreno=202004161954\\_RNmE](http://psihologija.ff.uns.ac.rs/etika/?odobreno=202004161954_RNmE)). Each respondent gave written informed consent for participation in accordance with the ethical procedures of psychological research. The data were collected via an online platform (Google forms), as a part of a broader study, during April and May 2020, while the country was in a state of emergency due to the COVID-19 pandemic. Participation was anonymous and voluntary. Filling out the questionnaires took about 30 minutes per participant. Each questionnaire contained the same general instruction for giving answers – the respondents were asked to consider every item of each scale in relation to the COVID-19 pandemic.

### Instruments

#### *Brief COPE*

The Brief COPE (Carver, 1997) is a 28-item self-report questionnaire designed to measure effective and ineffective ways to cope with stressful life events. It was developed as a short version of the original 60-item COPE scale (Carver et al., 1989), which was theoretically derived from various models of

coping. Scores are presented for each of the following subscales: Self-Distraction, Active Coping, Denial, Psychoactive Substance Abuse, Emotional Support, Use of Informational Support, Behavioral Disengagement, Venting, Positive Reframing, Planning, Humor, Acceptance, Religion, and Self-Blame. The scale can determine someone's primary coping style as either Approach Coping or Avoidant Coping, which is in accordance with a large number of previously mentioned taxonomies. Participant answers could range from 1 (*I haven't been doing this at all*) to 4 (*I have been doing this a lot*). Exploratory and higher order factor analyses in the Serbian sample are presented in the first part of study results.

### ***Perceived Stress Scale (PSS-10)***

The PSS-10 (Cohen & Williamson, 1988) is a self-report measure consisting of 10 items purposed to measure the perception of unpredictable and uncontrollable stress life events. Respondents give answers on a Likert-type scale with response categories ranging from 0 (*Never*) to 4 (*Very often*). The total score of perceived stress could be formed by summing across all 10 items (detailed procedure described in Cohen & Williamson, 1988). Consistent with some previous studies, the reliability of the overall measure in this sample was .83.

### ***Precautionary Measures Scale***

The Precautionary Measures Scale was designed for the purpose of this study. It is a unidimensional self-report measure consisting of 16 items that refer to behaviors of social distancing (e.g., *I avoid crowded places*) and enhanced hygiene (e.g., *I often disinfect my hands*) during the COVID-19 pandemic. Respondents give answers on a Likert-type scale with response categories ranging from 1 (*I don't agree at all*) to 5 (*I completely agree*). The total score of precautionary measures is formed by summing across all 16 items. The reliability of the overall measure in this sample was .89.

## **Results**

### **Descriptive Statistics**

Descriptive statistics are presented in Table 1. All analyses were performed on averaged summation scores. Almost all scales were normally distributed, with the exception of Psychoactive Substance Abuse, which had significant deviations from normal distribution, with both skewness and kurtosis being out of the suggested range of  $\pm 2$  (Finney & DiStefano, 2006).



**Table 1**  
*Descriptive statistics of coping strategies, perceived stress, and precautionary measures*

	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>	<i>Sk</i>	<i>Ku</i>
Coping Through Activation	8.00	32.00	2.92	0.56	-0.70	0.69
Support	5.00	20.00	2.45	0.76	-0.18	-0.71
Humor	3.00	12.00	3.02	0.78	-0.71	0.05
Religion	2.00	8.00	1.70	0.94	1.08	-0.15
Denial	4.00	16.00	2.26	0.38	0.19	1.38
Psychoactive Substance Abuse	2.00	8.00	1.23	0.55	2.80	8.29
Self-Handicapping	4.00	16.00	1.47	0.52	1.32	1.74
Approach Coping and Positive Reframing	19.00	70.00	2.67	0.50	-0.48	0.37
Avoidant Coping	10.00	30.00	1.74	0.33	0.95	1.38
Perceived Stress	0.00	3.70	2.13	0.44	-0.15	1.46
Precautionary Measures	1.00	5.00	3.47	0.84	-0.60	0.00

*Note.* *Min/Max* – minimal and maximal score; *M* – mean on item level; *SD* – standard deviation, *Sk* – skewness; *Ku* – kurtosis.

Having in mind means of Brief COPE subscales, we can see that some of the strategies have a more pronounced frequency of use compared to others. Humor and Coping Through Activation are the strategies that were most prevalent in an individual’s behavior, while Religion, Psychoactive Substance Abuse and Self-Handicapping were the least used during the pandemic. Means of Support and Denial are approximately equal to theoretical means (2.50), and represent moderately used coping strategies. It seems that strategies which form Approach Coping and Positive Reframing (*M* = 2.67) were more prevalent than Avoidant Coping strategies (*M* = 1.74) during the COVID-19 pandemic, but still their use does not deviate too much from the assumed prevalence (theoretical *M* = 2.50). It is also interesting that level of perceived stress during the pandemic was not so high, but that the prevalence of the precautionary behavior (3.47) in the same situation were slightly higher than it is assumed (3.00).

**Brief COPE - Exploratory and Higher Order Factor Analysis**

In order to investigate the latent structure of the Brief COPE, an exploratory factor analysis was conducted (Table 2). Parallel analysis coefficients were used as a criterion for selecting the number of factors (O’Conor, 2000). As a method, parallel analysis is recommended as the standard procedure for factor analysis, since the implementation of the principal axes method tends to underestimate the number of factors (Timmerman & Lorenzo Seva, 2011). The extracted number of factors in this research was 7, which explained 60.21% of the total Brief COPE variance.

Table 2  
*The factor structure of the Brief COPE – The pattern matrix*

Item	1	2	3	4	5	6	7
I've been concentrating my efforts on doing something about the situation I'm in.	.84						
I've been thinking hard about what steps to take.	.75						
I've been trying to come up with a strategy about what to do.	.69						
I've been turning to work or other activities to take my mind off things.	.66						
I've been taking action to try to make the situation better.	.65						
I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping or shopping.	.51				-.33		
I've been learning to live with it.	.50						
I've been trying to see it in a different light, to make it seem more positive.	.33						
I've been getting comfort and understanding from someone.		.93					
I've been getting help and advice from other people.		.90					
I've been getting emotional support from others.		.86					
I've been trying to get advice or help from other people.		.65					
I've been saying things to let my unpleasant feelings escape.		.43					
I've been making jokes about it.			.98				
I've been making fun of the situation.			.97				
I've been looking for something good in what is happening.			.44				
I've been refusing to believe that it has happened.				.77			
I've been saying to myself "this isn't real".				.70			
I've been accepting the reality of the fact that it has happened.				-.54			
I've been expressing my negative feelings.				-.41			
I've been blaming myself for things that happened.					.79		

I've been criticizing myself.	.68
I've been giving up trying to deal with it.	.53
I've been giving up the attempt to cope.	.35 .36
I've been using alcohol or other drugs to make myself feel better.	.94
I've been using alcohol or other drugs to help me get through it.	.93
I've been praying or meditating.	.94
I've been trying to find comfort in my religion or spiritual beliefs.	.93

Note. Factor loadings below .30 are omitted from the table.

The first factor was described by items that refer to behaviors that are characterized by overcoming the stress situation through more (e.g., *I've been trying to come up with a strategy about what to do*) or less (e.g., *I've been learning to live with it*) active strategies of coping, but with all items aimed at resolving the current distress. Therefore, the first factor, which explained 20.34% of the variance, was named *Coping through activation* ( $\alpha = .74$ ). The second factor was oriented to behaviors that are directed towards seeking or getting emotional (e.g., *I've been getting emotional support from others*) or instrumental (e.g., *I've been getting help and advice from other people*) support from other people. It was named *Social Support* ( $\alpha = .75$ ), and it described 11.39% of the Brief COPE variance. The third factor consisted of the three items that refer to humor adaptational style of coping and positive reframing, so it was named *Humor* (6.92% of explained variance;  $\alpha = .76$ ). The fourth factor was described by denying behaviors and thoughts that an individual uses to cope with a stressful situation. This factor explained 6.49% of the variance, and it was named *Denial* ( $\alpha = .69$ ). The fifth factor was operationalized through items oriented to behaviors that can be described as “giving up” on coping with the situation, but also through items that characterize behaviors as self-blaming and self-criticizing. Hence, this factor was named *Self-Handicapping* (5.61% of explained variance;  $\alpha = .67$ ). The last two factors consisted of only two items. *Psychoactive Substance Abuse* ( $\alpha = .88$ ) was operationalized through items that refer to the maladaptive coping strategy of using alcohol and drugs in order to cope with stressful situations (4.93% of explained variance). *Religion* ( $\alpha = .85$ ) was described by items whose content points to the importance of religion and spiritual beliefs in coping (4.51% of explained variance).

In order to gain a less ambiguous insight into the nature of coping mechanisms, a higher-order factor analysis was conducted (Table 3). In other words, the authors tried to identify “super-categories” of coping mechanisms, in accordance with certain recommendations in the relevant literature (Skinner et al., 2003).

Table 3

*The higher-order factor analysis of the Brief COPE – The pattern matrix*

	Approach Coping and Positive Reframing ( $\alpha = .78$ )	Avoidant Coping ( $\alpha = .67$ )
Coping Through Activation	.83	
Social Support	.78	
Humor	.65	
Religion	.42	
Denial		.71
Psychoactive Substance Abuse		.70
Self-Handicapping		.61
% of explained variance	27.22%	21.51%

*Note.* Factor loadings below .30 are omitted from the table.

The results of the higher-order factor analysis indicated two major factors of coping (48.73% of explained variance). *Approach Coping and Positive Reframing* was operationalized by subscales (Coping Through Activation, Support, Humor, Religion, and Denial) that measure more or less active behaviors that a person can engage in to cope with a stressful situation, based on emotion evaluation of the potential to solve or reframe the problem that induces stress. On the other hand, *Avoidant Coping* was operationalized by subscales (Denial, Psychoactive Substance Abuse, and Self-Handicapping) that refer to passive or maladaptive behaviors in a stressful situation. These types of behavior most often result in the avoidance of coping with stress. The intercorrelation between these factors was positive and modest ( $r = .30, p < .01$ ).

### **Relations between Perceived Stress and Taking Precautionary Measures: The Mediating Role of Two Overarching Coping Strategies**

A hierarchical regression analysis (Table 4) was conducted in order to test the mediating role of approach and avoidant coping strategies in relations between perceived stress and taking precautionary measures during the COVID-19 pandemic.

Table 4  
*The mediating role of coping strategies in relations between perceived stress and taking precautionary measures*

Step	Model summary		$\beta$	$t$
1	$F(1, 580) = 24.70^{**}$ $R^2 = .04$	Perceived Stress	.20	4.97**
2	$F(3, 578) = 11.42^{**}$ $R^2 = .06$ $\Delta F = .02^{**}$	Perceived Stress	.18	4.21**
		Approach Coping and Positive Reframing	.12	2.68**
		Avoidant Coping	-.09	-2.01*

Notes.  $F$  – value of the F-test;  $R^2$  – multiple determination coefficient;  $\Delta F$  – change of F-value in the second step;  $\beta$  – standardized partial effect of the predictor;  $t$  – t-test value.

\*  $p < .05$ . \*\*  $p < .01$ .

The first model included perceived stress as a predictor and taking precautionary measures as a criterion and it was statistically significant on the  $p < .01$  level. The level of perceived stress had a positive effect on taking precautionary measures during the COVID-19 pandemic and explained 4% of this kind of behavior. Additional analyses revealed that perceived stress had a significant ( $F = 76.01$ ;  $R^2 = .12$ ;  $p < .01$ ), and positive ( $\beta = .34$ ;  $p < .01$ ) effect on approach coping and reframing, as well as a significant ( $F = 39.76$ ;  $R^2 = .06$ ;  $p < .01$ ), and positive ( $\beta = .25$ ;  $p < .01$ ) effect on avoidant coping. In the second step (6% of explained criterion variance), the positive effect of perceived stress was also significant and both types of coping strategies were significant mediators in relations between perceived stress and taking precautionary measures, which characterizes these strategies as partial mediators. The strategy of approach coping and positive reframing had a positive effect on taking precautionary measures, which leads to the conclusion that coping mechanisms of this kind facilitate the effect of perceived stress on precautionary behavior during a pandemic. On the other hand, avoidant coping had a negative effect on precautionary behaviors. Therefore, it seems that in the context of coping, avoidant behaviors partially eliminate the positive effect of perceived stress on taking precautionary measures.

## Discussion

### Initial Considerations: Factor Structure of the Brief COPE

The popularization of attempts to measure coping from the 1970s onwards has led to the overproduction of coping instruments, which has resulted in a multiplication of coping taxonomies and difficult communication among stress researchers (Lacković-Grgin, 2004; Stone et al., 1992). Namely, not only did the application of different measuring instruments of this type result in the separation of numerous coping strategies, but the latent space of the same instruments was described through different studies in terms of mutually inconsistent coping dimensions. Given the fact that the Brief COPE also has a reputation as an instrument with a highly unstable factor structure, the procedure of exploratory factor analysis was applied before conducting the main statistical analyses. Additionally, knowing that the factor structure of this measuring instrument depends on the reference framework in relation to which the assessment of coping mechanisms is performed (Krägeloh, 2011), it seemed reasonable to determine which dimensions of coping stand out in the context of the current COVID-19 pandemic. This further means that the situational scale format was applied in the research, i.e., that the respondents assessed the items of the scale having in mind (only) the duration of the first wave of the pandemic, after the declaration of a state of emergency in the Republic of Serbia.

The obtained results showed that the 7 selected factors summarized 14 coping strategies that Carver (1997) operationalized through a significantly reduced collection of items, in relation to the originally constructed COPE scale (Carver et al., 1989). The first factor brought together strategies that involve taking various actions with the goal of mitigating the effects of stress. Some of these activities include thinking about ways to deal with a stressful situation (Planning) and taking concrete measures to solve the problem (Active Coping), while other activities are aimed at trying to look at the stressful situation differently (Positive Redefining), getting used to stressful circumstances (Acceptance), and shifting the focus of attention to actions that are not related to the source of stress (Self-Distraction). Based on the significance of the mentioned strategies, we can conclude that they can be classified into the group of problem-focused strategies. Within these strategies, Planning and Active Coping reflect the subtype that is characterized by a focus on changing environmental conditions, while Positive Redefining, Acceptance, and Self-Distraction are marked by a noticeable preoccupation with changes on the intrapsychic level (Rani & Batra, 2015). The second factor united the tendencies towards seeking emotional and instrumental support from the social environment. Since instrumental support is reflected in seeking information from other people, it is most often associated with problem-focused strategies. However, certain authors have rightfully pointed out the fact that this type of activity plays a particularly

important role in the emotional functioning of an individual, reflected in the reduction of fear and anxiety (Compas et al., 1999). Hence, we can say that the strategies that define the second factor can be classified into the group of strategies focused on emotions. The factors of Denial, Self-Handicapping, and Psychoactive Substance Abuse included activities aimed at cognitive or behavioral avoidance and denial of the existence of the problem, which is why they can be classified into the group of strategies that some authors call avoidance coping (Elliot et al., 2011; Kausar, 2017), even though they are singled out as separate factors. In this analysis of isolated factors, the functions of Humor and Religion strategies remain unclear, given that these factors do not have the explicit meaning of avoiding and denying the problem. Strikingly similar results of the Brief COPE factor structure were obtained by Carver (1997), on a sample of subjects who were exposed to Hurricane Andrew, which hit the Bahamas, Florida, and Louisiana in August 1992. Namely, distributing about 9 isolated factors, the 14 strategies mentioned in Carver's research formed the first factor that corresponded to problem-focused coping and the second factor that corresponded to emotion-focused coping, while Denial, Self-Handicapping, and Psychoactive Substance Abuse stood out as separate factors that determined avoidance coping. On the other hand, in this research, Humor and Religion did not find a place in any category based on the coping mechanism function.

A higher-order factor analysis was performed on isolated factors for several reasons: 1) Denial, Self-Handicapping, and Psychoactive Substance Abuse stood out as separate factors, although they undoubtedly refer to palliative measures reminiscent of repression, with the provision that they are conscious processes (Lacković-Grgin, 2004); 2) Humor and Religion also stood out as separate factors, but their functions as coping strategies remain unclear; 3) the relevant literature suggests the validity of the allocation of "super-categories" or higher-order coping mechanisms, in order to get a clearer idea of their nature (Skinner et al., 2003). Consequently, the isolated factors were divided into two higher-order factors: 1) Approach Coping and Positive Reframing, which brought together Coping through activation, Support, Humor, and Religion; and 2) Avoidance Coping, on which Denial, Psychoactive Substance Abuse, and Self-Handicapping had the highest saturations. The obtained results primarily indicate that problem-focused coping and emotion-focused coping were combined into one factor, which can be explained by the specific context in which coping mechanisms were considered in this study. Namely, in the relevant literature, it is stated that people are more inclined to use problem-focused coping strategies in controllable situations, while emotion-focused coping strategies are activated in case of facing problems that seem unsolvable and beyond one's control (Furman et al., 2018; Kristofferzon et al., 2018; Snyder & Dinoff, 1999). Given that the research presented in this paper was conducted during the first wave of the pandemic, when public opinion regarding COVID-19 implied a worryingly high degree of ignorance of the problem, it is reasonable to conclude that respondents did not have a clear perception of controllability. Accordingly,

in dealing with the new situation, people tried to rely on both problem-focused and emotion-focused strategies. Furthermore, the relevant literature states that coping strategies focused on the problem and those focused on emotions are most often used simultaneously with the possibility of a favorable interaction (Furman et al., 2018). However, what the first higher-order factor also reveals is that Humor and Religion, which are in positive correlation with the factor, contribute to the strategies aimed at dealing with different aspects of pandemic situation (Cope through activation and Support) and that religious beliefs and humorous reviews of stressful situations reduce the unpleasant feelings, without changing the objective situation (Lazarus & Folkman, 2004). In other words, Humor and Religion participate in the action of strategies focused on emotions, and from the results of descriptive statistics we can conclude that Humor participates in much larger extent since it represents one of the most prevalent coping strategies in an individual's behavior, while Religion, was the least used during the pandemic. When it comes to the second factor, its structure confirms the validity of classifying Denial, Self-Handicapping, and Psychoactive Substance Abuse into coping strategies, which supports taxonomies that associate problem-focused and emotion-focused coping with avoiding coping and denying problem-solving.

### **The Mediating Role of Higher-Order Coping Mechanisms**

After obtaining a more concise overview of the dimensions of coping in the conditions of the COVID-19 pandemic, a hierarchical regression analysis was performed in order to examine the potential mediating effects of higher-order coping mechanisms in the relationship between perceived stress and precautionary behaviors in the context of a pandemic. In the first step of the analysis, it was found that the perception of pandemic circumstances as highly stressful had a positive effect on the tendency to adhere to the prescribed precautions. However, the percentage of explained variance (only 4%) indicates a rather weak explicative power of the predictor variable. The discussion of this finding can be related to the explanation of the cognitive appraisal – a key concept of transactional stress theory, which is also one of the mediating variables in the stress process (Tran et al., 2018). As stated in the introductory part of the paper, the primary cognitive appraisal determines whether an individual will experience a specific event as a threat, loss or a challenge (Beer & Moneta, 2012; Lazarus, 1990; Mclean et al., 2007). Through the secondary cognitive appraisal, the person decides whether the stressor is controllable and what options are available to deal with it (Oláh, 2005). In other words, the stress process begins not only with the perception of a particular situation as a stressor, but also with the associated assessment that the demands of the situation far exceed the individual's capacity to respond adequately (Lefcourt, 1992). Given the items on the scale that examine the perception of stress (“I



had the impression that I could not cope with everything I had to do.", "I had the impression that I could not control important things in life."), it is possible to conclude that responding to items included both: an assessment of the requirements of the situation and an assessment of the possibility of coping. This further means that participants were implicitly required to perform primary and secondary cognitive appraisal operations. Having in mind that the data were collected during the first wave of the pandemic, when the degree of ignorance of the problems was at a very high level, it is quite certain that the cognitive appraisal of the situation was performed in conditions of general confusion and low control over the circumstances. Namely, during the first wave of pandemic, even the epidemiology experts were facing the unknown phenomenon and high level of uncertainty and was forced to offer *ad hoc* solutions, which differed over the short span of time. This made it difficult to accurately assess the extent to which the circumstances of the pandemic were stressful for an individual. We can support such claim with the results of descriptive statistics which show that the level of perceived stress during the pandemic was not so high. Because of this, the prediction of practicing precautionary measures, in the form of physical/social distancing and enhanced hygiene measures, relied to a low degree on an insufficiently differentiated notion of the stress process start point.

In the second step of the hierarchical regression analysis, higher-order coping mechanisms were also included in the model, as assumed mediating variables. The obtained results suggest that the predictor variable still made a significant contribution to the explanation of the criteria, but also that both higher-order coping mechanisms represented significant mediators in the relationship between perceived stress and the practice of precautionary measures, which made the established mediation partial. In this regard, approach coping and positive reframing had a positive effect on the tendency to adhere to precautionary measures. This indicates that this coping strategy enhances the effects of perceived stress on the practice of precautionary measures during a pandemic. On the other hand, avoidance coping had negative effects on the output variable, which leads to the conclusion that this coping strategy reduces the effects of perceived stress on the practice of precautions during a pandemic. By adding coping mechanisms to the regression model, the percentage of explained variance of the criteria increased by only 2%, while the standardized partial effects of the predictors suggest that perceived stress had a significant, but not particularly strong effect on precautionary behaviors. Once again, we could look for an explanation of the obtained findings in the domain of cognitive appraisal. Namely, after assessing the degree to which pandemic circumstances are perceived as stressful, which is a part of the primary cognitive appraisal, the individual engages in an evaluation process focused on the use of coping mechanisms to minimize potential harm and/or increase the likelihood of gains, which is a part of the secondary cognitive appraisal (Davenport, 2012). If the primary cognitive appraisal is performed in circumstances of

insufficient knowledge of the pandemic in terms of loss, danger, and challenge, it is quite logical that it could be difficult to consider the mechanisms of coping with that situation within the secondary cognitive appraisal. In other words, if an individual is not able to clearly assess the extent to which a pandemic is a loss, danger or a challenge, this situation is more than likely to be reflected in the assessment of the strategies to cope with the circumstances of the pandemic. However, despite the weaker mediating effects of coping mechanisms, the results show that the perception of a pandemic as stressful has a greater effect on adherence to precautionary measures if the individual opts for coping mechanisms within which he/she is preoccupied with this problem, while taking a positive perspective. The effectiveness of the strategy of positive reinterpretation of stressors was also revealed in a comprehensive meta-analysis of 34 studies that examined the relationships between coping mechanisms and different indicators of psycho-physical well-being of an individual (Penley et al., 2002). On the other hand, avoidance coping tends to reduce the effects of assessing a pandemic as stressful, which results in a lower level of practice of precautionary measures. In the abovementioned meta-analytical study, it was found that people who predominantly used avoidance coping more often reported negative health consequences.

The contribution of the obtained results is reflected in the double interpretation of the nature of coping mechanisms in the context of the pandemic. First, the factor structure of coping shows us that in a situation of confrontation with an accidental crisis that is mostly unknown, there is a combined action of problem-focused confrontation and emotion-focused confrontation, which is "enhanced" by religiosity and positive redefinition of stressful circumstances. In other words, it turns out that any behavior that is not a part of avoidance coping represents a unique framework from which the individual acts in order to mitigate the consequences of an insufficiently clear and poorly controllable stressful situation. Second, coping mechanisms aimed at dealing with the problem, as well as avoidance coping mechanisms, mediate in the relationship between the perception of a pandemic situation as stressful and practicing the prescribed protective measures. However, their facilitative or restrictive effect is significantly reduced by insufficient certainty and controllability of the context. Hence, it can be concluded that the lack of unambiguous interpretations of the medical profile of the COVID-19 pandemic interferes with the mechanisms of action of coping strategies and consequently, with the individual's readiness to adhere to the prescribed personal protection measures and prevent the further spread of the pandemic. The practical implications of such results are reflected in the emphasis on the importance of providing accurate and timely information regarding the global crisis situations. Namely, cognitive appraisal requires a clear insight into the nature of a stressful situation, so that the individual can adequately assess its requirements and engage in effective coping strategies which can facilitate preventive health behavior.

On the other hand, the limitation of the research concerns the content validity of the Brief COPE, which seems problematic in the context of examining coping with stress caused by a pandemic situation. Namely, this instrument is more suitable for examining coping mechanisms that are activated in the context of personal stressful situations. Therefore, an accidental crisis of global proportions, such as the COVID-19 pandemic, requires an instrument whose items would be more sensitive to its extremely high stress potential.

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## KOPING MEHANIZMI KAO MEDIJATORI U RELACIJI IZMEĐU PERCIPIRANOG STRESA I MERA PREDOSTROŽNOSTI TOKOM PANDEMIJE COVID-19

Aktuelna pandemija COVID-19 predstavlja akcidentnu krizu globalnih razmera koja je pred čovečanstvo postavila zahtev adaptivnog savladavanja nepoznatih i nisko kontrolabilnih stresora. Upravo zbog toga, ovo istraživanje u glavnom fokusu ima koping mehanizme, koji su najpre razmatrani u domenu njihove faktorske strukture, da bi se nakon toga ispitala medijatorska uloga koping mehanizama u relaciji između percepcije stresa i mera predostrožnosti u kontekstu pandemije. U istraživanju su učestvovala 582 odrasla ispitanika sa teritorije Srbije (75,7% žena), prosečne starosti 38,74 godine ( $SD = 10,48$ ). U merenju koping mehanizama primenjena je skala Brief COPE (Coping Orientation to Problems Experienced), percepcija stresa je ispitana skalom PSS (Perceived Stress Scale), dok je sklonost ka pridržavanju propisanih mera predostrožnosti ispitana skalom koja je konstruisana za potrebe istraživanja. Eksplorativnom faktorskom analizom izdvojeno je 7 koping strategija, od kojih prva po funkciji odgovara suočavanju usmerenom na problem, druga suočavanju usmerenom na emocije, u trima izolovanim dimenzijama se prepoznaju strategije suočavanja izbegavanjem, dok se funkcija Humora i Religije nije mogla jasno odrediti. Nakon sprovođenja faktorske analize višeg reda izdvojena su dva faktora: prvi koji objedinjuje suočavanje usmereno na problem, odnosno na emocije, Humor i Religiju, i drugi faktor koji okuplja mehanizme usmerene na suočavanje izbegavanjem. Rezultati hijerarhijske regresione analize sugerišu značajne parcijalne medijatorske efekte koping mehanizama, pri čemu prvi faktor višeg reda pospešuje efekte percepcije stresa na praktikovanje mera predostrožnosti, dok drugi faktor višeg reda ove efekte umanjuje. Dobijeni rezultati otvaraju pitanje primerenosti procene stresa uzrokovanog akcidentnom krizom standardnim instrumentima za merenje koping mehanizama, kao i mogućnosti adekvatnog reagovanja na stresore koji su nepoznati i nisko kontrolabilni.

**Ključne reči:** COVID-19, koping mehanizmi, mere predostrožnosti, percepcija stresa