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Sadržaj

Contents

INTRODUCTION TO THE SPECIAL ISSUE ON MENTAL HEALTH IN TIMES OF CRISIS

Throughout human history, this is not the first global threat by infectious diseases that we face. However, while addressing the physical consequences of disease, this time more than ever before, the psychological effects of such pandemic are probably even more serious. A most prominent characteristic of this pandemic is an overall uncertainty, and this extended period of uncertainty could elevate anxiety (Taylor, 2019). For most people, such situation induces an anxiety reaction that is either adaptive (i.e. implementing preventive measures) or maladaptive (worsening the overall mental health and well-being). Although infectious diseases have always invoked fear and anxiety, this response has never been so global, as it is the case with COVID-19, due to global information connectivity (Jokić-Begić et al., 2020).

The ability to spread information quickly during the pandemic has proven to have numerous advantages. It enables health systems to prepare, and allows individuals to understand the threat. Information has also served to raise anxiety, which, in turn, has prompted the swift and widespread adoption of preventive measures implemented by authorities. Unfortunately, the lockdown and psychical distancing measures might have unintentionally directed people towards news and social media, which are often flooded with catastrophic (mis) information about COVID-19. Experiences with previous and current health crises suggest that repeated media exposure to such a threatening information can lead to the increased anxiety and heightened stress responses that can further lead to downstream effects on health (Garfin et al., 2020).

In the past two decades, numerous studies have confirmed that the experience of quarantine and social isolation is associated with higher rates of stress-related mental health problems, such as anxiety, depression, and especially avoidance behavior (Pietrabissa & Simpson, 2020; Reynolds et al, 2008). Faced with changed circumstances of our everyday lives, there is expected continuous perception of a possible threat if preventive measures are not followed, economic consequences of pandemic, and effects of social isolation and physical distancing, with multiple consequences on our mental health. Thus, it is important to join a vivid scientific community in this period, explore protective and risk factors for mental health problems, and this special issue of the journal is our contribution to knowledge gathered so far.

This special issue of *Applied Psychology* is comprised of selection of five papers focused on mental health and pandemic related behavior. The first paper examines possible differences and factors that contribute to risk perception and compliance with preventive measures at the beginning and the end of the first wave of COVID-19 pandemic. In general, findings suggest a much more pronounced role of personality traits in adherence to protective measures at the end than at the beginning of the first wave of the COVID-19 pandemic in

Serbia. Also, the results indicate the role of unrealistic optimism regarding negative life events in lower compliance with protective measures. The second paper is focused on protective and risk factors of students' psychological well-being during self-isolation. It confirms the protective role of being informed, social support and physical activity on mental health, but also interesting and complex role of conspiracy theories in maintaining good well-being. The third paper 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 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 adequate response to stressors that are unknown and poorly controllable. The fourth paper examines the relationship between intolerance of uncertainty and distress, whereas a mediation role of media exposure and fear of COVID-19 has been tested. As the second paper, this one also confirmes the importance of media exposure for mental health during pandemic. Finally, the fifth paper focuses on stockpiling, behavior seen in this crisis, as well as in other crisis situations. The authors of this paper explore the role of personality traits on stockpiling during the COVID-19 pandemic, and present the obtained results, which show that it is probably more the result of selfishness than of fear.

I believe you will find this special issue of the journal very interesting, as it raises some provocative questions on how and why people feel and behave the way they do during the pandemic.

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UNREALISTIC OPTIMISM AND HEXACO TRAITS AS PREDICTORS OF RISK PERCEPTION AND COMPLIANCE WITH COVID-19 PREVENTIVE MEASURES DURING THE FIRST WAVE OF PANDEMIC

The aims of this study were to examine possible differences and factors that contribute to risk perception and compliance with preventive measures at the beginning (T1) and the end (T2) of the first wave of COVID-19 pandemic. The sample consisted of 423 participants (M = 30.29, SD = 14.45; 69% female). Compliance, risk perception and trust in information were significantly higher in T1 than T2. For risk perception, significant predictors in both T1 and T2 were age, Emotionality (HEXACO-PI-R) and Unrealistic Optimism (NLE, Negative Life Events). Trust in information was a significant predictor in T1, while Unrealistic Optimism (Positive Life Events) was a significant predictor in T2. For compliance, significant predictors in T1 were gender and trust in information while in T2 were Emotionality, Extraversion, Conscientiousness (HEXACO-PI-R), NLE and trust in information, for both T1 and T2. In general, findings suggest a much more pronounced role of personality traits in adherence to protective measures at the end than at the beginning of the first wave of the COVID-19 pandemic in Serbia. Also, the results indicate the role of unrealistic optimism regarding negative life events in lower compliance with protective measures.

Keywords: compliance to protective measures, COVID-19, HEXACO, risk perception, unrealistic optimism

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Introduction

The ongoing COVID-19 pandemic has already been characterized as the greatest global challenge since World War II, both from the aspect of its impact on world economy and its implications for peoples' physical and mental health. Since the pandemic outbreak in Wuhan, China, more than 40 million people worldwide have been infected, and more than 1 million have died due to COVID-19. The first case of COVID-19 in Serbia was reported on March 6, 2020. By the end of October, there were more than 40,000 officially confirmed COVID-19 cases and more than 800 people had died due to the complications caused by the coronavirus. Although the number of newly reported cases is growing daily at the moment of writing this article, and largely exceeds daily numbers reported during the first wave of the pandemic, rules and guidelines set by government officials are still limited to keeping social distance, wearing masks, disinfecting hands, and partial remote learning in schools and faculties.

The single state of emergency due to the COVID-19 pandemic in Serbia is still the one declared on March 15, 2020. Five days later, curfew was established at the country level, prohibiting anyone from leaving homes from 8 p.m. till 5 a.m. The state of emergency has lasted for 22 days, during which period all public facilities, restaurants, shopping malls, universities, schools, and kindergartens were closed. Persons over 65 were not allowed to leave their homes, except early on weekends until 7 a.m. for basic shopping. The slight loosening of measures began at the end of April, and the state of emergency was cancelled on May 6, two months after the first recorded case of COVID-19. Elections for the Serbian parliament were held in June and were followed by the second wave of pandemics. After the temporary decrease in the number of newly reported cases in September, Serbia is currently experiencing the third wave of the pandemic with the number of daily cases reaching more than 6,000, which is several times more than the highest daily numbers during the first and second waves.

Constant threat of being infected and the stress caused by social isolation and lockdowns have shown to have weighty impact on peoples' wellbeing, manifested primarily through the symptoms of anxiety, depression, anger, and confusion (Brooks et al., 2020; Huang & Zhao, 2020; Wang et al., 2020). The role of psychological research in such high-risk situations should be not only to explain emotional and behavioral reactions to pandemics, and discuss ways to address the resulting psychological problems, but also to trace the guidelines for public health policies, primarily those related to risk communication (Taylor, 2019). Regarding the latter, it was shown that high prevalence of mental health problems during the COVID-19 pandemic was positively associated with more frequent exposure to social media (Gao et al., 2020). It may be assumed that in high-anxiety situations such as virus outbreaks, the perception of risk and trust in information, particularly those provided by the officials, become

essential components of preventive public health strategies to reduce the spread of the disease.

In order to offer an overview of the current topics related to the psychological aspects of the COVID-19 pandemic, we have analyzed the most frequent keywords in articles published in journals covered by Scopus, a leading international bibliographic citation database. Database was searched for articles containing the keyword "COVID-19" and published in the field of psychology. A total of 1,941 articles were found, and their bibliographic metadata were extracted and visualized using VOSviewer (Van Eck & Waltman, 2010), a software tool for analyzing and visualizing scientific literature. Figure 1 shows the map of clusters based on the coincidence of keywords from articles' titles, abstracts, and keywords. Size of the circles depict the prevalence of each keyword, and their positions reflect the strength of relationship based on keyword co-occurrence frequency. Clusters with the largest number of frequent keywords show that most popular research topics are those related to emotional responses to COVID-19 pandemic, online delivery and facilitation of health-related services (telehealth), and health-related behaviors. Most of the COVID-19-related articles in the field of psychology are focused on emotional responses to isolation, primarily anxiety, depression, and fear (purple and brown clusters).

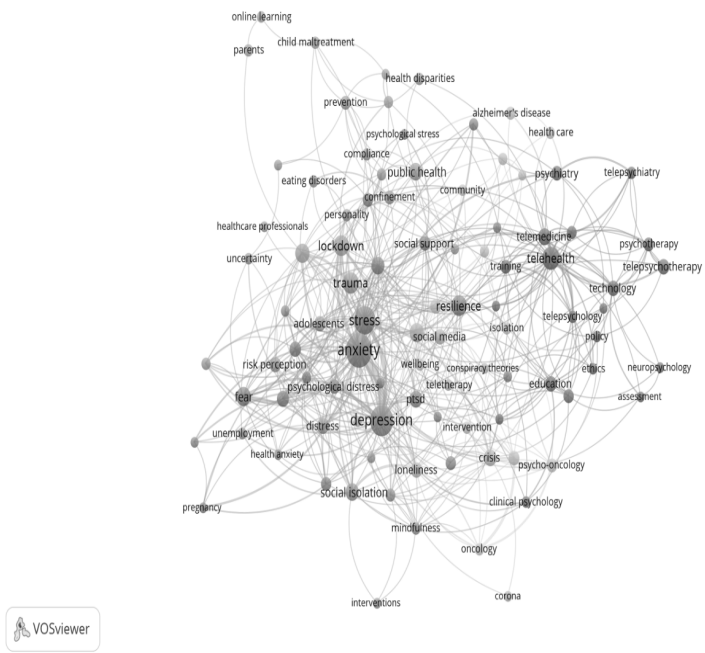

Figure 1. The coincidence map of keywords forming clusters of various psychological research topics related to the COVID-19 pandemic

Another relevant topic deals with the issues of finding appropriate ways to provide psychological support and assistance to people in newly emerged situations caused by the demand for social isolation (red cluster). The map also shows that resilience and social support (blue cluster) are two centrally relevant issues that act as a hub connecting all other topics. In this article, however, we have focused on what seems to be slightly neglected aspect of the pandemic and that is public health, specifically various health-related behaviors that may reduce the spread of COVID-19 (green cluster). Keywords within the green cluster indicate that public health behavior is often related to the compliance with preventive measures (e.g., confinement), but also to the perception of risk in emergency situations, as well as various personality traits. Previous studies have shown that the coronavirus pandemic generally provokes two somewhat different sets of reactions, one associated with a possible infection and the other associated with preventive measures (Bacon & Corr, 2020; Chen et al., 2020; Li et al., 2020). Stable predispositions, such as personality traits, emotional and cognitive coping strategies are highlighted among the factors that have an important contribution to the explanation of both types of reactions to the coronavirus pandemic (Lippold et al., 2020; Pagnini et al., 2020; Volk et al., 2021).

In the very initial phase of the pandemic, stable individual differences were less pronounced, since most people were anxious and frightened facing this type of threat for the first time (Sadiković et al., 2020). By reducing individual differences, these emotional reactions represented a possible functional and adaptive response to a threat that is global, unknown and therefore uncontrollable. Moreover, this decrease in magnitude of negative emotions is in line with a set-point theory of wellbeing (Bonanno, 2004), which predicts that at the beginning of a traumatic event, shifts in typical functioning are experienced over several weeks, after which normal balance is established. Therefore, identifying stable predispositions that contribute to risk perception (Duan et al., 2020) and protective health behavior (Brouard et al., 2020) in long terms is one of the most important tasks in research into psychological responses to the COVID-19 pandemic. Personality traits are one of the most important factors shaping coronavirus pandemic behavior (Brouard et al., 2020).

In our study, personality traits were examined using the HEXACO model. Unlike the dominant five-factor models, which include neuroticism, extraversion, conscientiousness, agreeableness, and openness (e.g., Costa & McCrae, 1992; Saucier & Goldberg, 1998), the HEXACO model suggests that a six-factor structure emerges in lexical studies of personality (Ashton & Lee, 2007). Within this model, Extraversion, Openness and Conscientiousness, correspond to the same dimensions within the five factor models, while Emotionality and Agreeableness somewhat resemble neuroticism and agreeableness from the Big Five (e.g., Zettler, 2020). The most significant difference between HEXACO and the five factor models is the sixth factor, which encompasses the Honesty/Humility variance, defined by traits such as honest, fair and modest, versus

cunning, false, greedy and pretentious (Lee & Ashton, 2008; Međedović et al., 2019). Personality traits, especially Big Five Agreeableness and Conscientiousness (Ingledew & Brunning, 1999), as well as Extraversion and Conscientiousness (Carvalho et al., 2020) are related to preventive health behavior. Moreover, Conscientiousness, Neuroticism and risk perception are associated with social distancing, as a form of preventive behavior (e.g., Abdelrahman, 2020).

However, studies have shown that cognitive factors, such as cognitive bias or trust in information, have a great influence on risk perception and compliance with preventive measures (Shepperd et al., 2017). For example, unrealistic optimism can discourage preventive action in risk groups (Sweeny et al., 2006) and play an important role in risk perception and preventive health behavior. Unrealistic optimism refers to the tendency of healthy individuals to underestimate the likelihood of experiencing future negative life events, including future illness or disease, as well as to overestimate the likelihood of experiencing future positive life events, such as longevity, good health, or wealth (Weinstein, 1980, 1989). This cognitive strategy can explain a wide range of risk behaviors, including health-related habits.

Some research has shown that controllability plays an important role in assessing the resources to deal with negative events (Chambers et al., 2003), since people are optimistic only in the case of controllable but not uncontrollable situations, as well as in the case of events that are more likely to occur in the general population. In the case of coronavirus, unrealistic optimism leads to the assessment that the probability of getting infected and of subsequently infecting others is lower for themselves than for others (Dolinski et al., 2020). Specifically, during COVID-19 pandemic, unrealistic optimism may lead to an underestimation of individual risk (Monzani et al., 2021), which directly endangers public health. Namely, various studies have shown that people are less likely to take health precautions if they perceive their risk as low (Floyd, et al. 2000). Therefore, unrealistic optimism reflects the perception that there is no danger even when it is not in line with reality, which can lead to risky health behaviors (Bottemanne et. al, 2020). During the H1N1 epidemic in 2009 (Cowling et al., 2010), the MERS-CoV epidemic in 2015 (Jang et. al., 2020) and COVID-19 pandemic in 2020 (Sadiković et al., 2020), research have shown that prolonged exposure to threats increases the sense of familiarity, gradually reducing the perceived risk.

Overall, previous empirical results suggest that health protective behaviors during the COVID-19 pandemic should be based on an understanding of various stable predispositions (Brouard et al., 2020; Lippold et al., 2020; Zajenkowski et al., 2020). Risk perception and compliance with preventive measures have a direct impact on public health and the epidemiological situation (Duan et al., 2020). Since previous studies have shown that prolonged exposure to threats reduces the perception of danger (Cowling et al., 2010; Jang et. al., 2020; Sadiković et al., 2020), first goal of this research is to examine possible differences in risk perception and compliance with preventive measures at the

beginning and the end of the first wave of coronavirus pandemic. The second goal of this study is to examine the factors that contribute to risk perception and compliance with protective measures during the first wave of coronavirus pandemic. Specifically, this aim is to examine the contribution of the HEXACO personality traits, comparative unrealistic optimism, and trust in information provided by the government to the individual variation in risk perception and compliance with preventive measures at the beginning and the end of the first wave of the COVID-19 pandemic. Based on the set-point theory of wellbeing (Bonanno, 2004), the premise is that after 5 weeks of emergency, the impact of stable predispositions on the coronavirus response will be more pronounced than at the beginning of the pandemic.

Method

Sample and Procedure

This research was part of a broader study, previously described elsewhere (Sadiković et al., 2020). There were 458 participants who participated during the first week of measurement, and of those, 423 participants also participated during the sixth week of the data collection period. The sample characteristics, for both T1 and T2, are shown in Table 1. More information about the sample is given in the Appendix A.

Table 1
The sample characteristics for T1 and T2

		T1	T2
Age	Minimum	18	18
	Maximum	85	85
	M	30.15	30.29
	SD	14.41	14.45
Sex	Male	148 (32.3%)	131 (31.0%)
	Female	310 (67.7%)	292 (69.0%)
Educational level	Primary School	4 (0.9%)	4 (0.9%)
	High school	142 (31.0%)	128 (30.3%)
	University education	128 (27.9%)	118 (27.9%)
	Magister or PhD degree	15 (3.3%)	14 (3.3%)
	Student	169 (36.9%)	159 (37.6%)

Note. M – mean*; SD* – standard deviation.

A custom web application was developed for participants to join the study. For each participant, random code was generated which they used to access different surveys and questionnaires. The anonymity of participants was protected and it allowed students to receive adequate curriculum points. All questionnaires were administered using the Google Forms platform. Four types of forms were administered during the research. After providing informed consent each participant completed the first set of instruments, containing questions about various sociodemographic information and different trait questionnaires including the HEXACO-PI-R and Unrealistic Optimism Scale. Second form was the survey administered daily, from Monday to Saturday each week, while weekly form (third form) was administered each Sunday. Fourth type was a monthly survey administered on the last day of the month. Data was collected during the state of emergency in Serbia starting from March 21 up to May 6. In this research data from the first week – T1 (March 21 – 27) and sixth week – T2 (April 25 to May 1) was used, as well as data from monthly surveys (March 31 and April 30).

Instruments and Measures

HEXACO-PI-R

HEXACO-PI-R (Lee & Ashton, 2018; for Serbian adaptation see Međedović et al., 2019) is a questionnaire intended to measure six domain-level traits through 96 items with five-point Likert scales. Traits measured were Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to experience. Cronbach's alpha coefficients of the scales were good, ranging from .79 to .86.

Unrealistic Optimism Scale

UOS (Čolović et al., 2010) is intended to measure two domains of comparative unrealistic optimism through 17 items: unrealistic optimism for positive life events (UOS-PLE; 11 items, e.g., "*That you will never have to go to the hospital*") and unrealistic optimism towards negative life events (UOS-NLE; 6 items, e.g., "*That you will be hit by some natural disaster*"). Items are formulated so that respondents assess their own chances of experiencing positive and negative life events compared to the chances of average people. All items were measured on a five-point Likert scale. Cronbach alpha coefficients for scales were good, .84 for UOS-PLE and .81 for UOS-NLE.

Responses to Coronavirus and Isolation Survey

These surveys, administered daily, weekly or monthly, assessed how participants are handling the COVID-19 pandemic and the state of emergency in Serbia through assessment of their affective, behavioral and cognitive responses to the situation. In this research questions from daily and monthly surveys were used. Questions from daily surveys were: "*How afraid are you that you will be infected with the coronavirus today?*", and "*How afraid are you that someone close will be infected with the coronavirus today*?", and those two questions were used to measure Risk perception. Questions from monthly surveys were: "*I have acted responsibly towards myself and others (wore protective gloves, masks, avoided close contact etc.)*", "*I have acted in accordance with the recommendations of the government*." – for measuring Compliance, and "*I had confidence in the accuracy of the information published by the competent institutions*." – for measuring Trust in information. All questions were measured using a five-point Likert scale.

Data Analysis

Analyses were performed in SPSS 21 statistical software (IBM Corp, 2012).. In order to examine possible differences between Compliance, Risk perception, and Trust in information between T1 and T2, dependent samples t-test was used. Series of multiple regression models were run in order to examine how personality traits (HEXACO-PI-R and UOS) and Trust in information are related to Compliance and Risk perception. Two regression models were run for both Compliance and Risk perception, one for T1 and another for T2. Age and Gender were entered into each regression analysis as control variables. Dataset is available at: https://osf.io/n7t2s/?view_only=49985bd9211043658daf8928bd9803c2.

Results

Descriptive Analyses

Descriptive statistics and correlation coefficients for all research variables are shown in Appendix D. Values of skewness and kurtosis indicated that all measures had a normal distribution, in the terms of the conventional criteria (±1.5; Tabachnick & Fidell, 2013). Correlations for the same measure in different time points, for compliance, risk perception, and trust in information, were significant, positive and had moderate intensity. Correlation between personality dimensions, and between two dimensions of unrealistic optimism, had low intensity, in line with the theoretical assumptions. Correlations between criterion and predictor variables were low to moderate in intensity, mainly in a

positive direction while relationships between predictor variables were low in intensity.

Differences in T1 and T2, for compliance, risk perception and trust in information, areshown in Figure 2. Participants had statistically higher score on all three measures - compliance ($t(422) = 8.60$, $p < .001$), risk perception ($t(422) = 18.77$, $p < .001$) and trust in information ($t(422) = 5.26$, $p < .001$), in T1 compared to T2. Effect size (Cohen, 1977) indicated small effect for trust in information ($M_{DIF} = .26$, $d = .25$), small to medium effect for compliance ($M_{DIF} = .58$, $d = .417$) and large effect for risk perception ($M_{DIF} = 1.40$, $d = .889$).

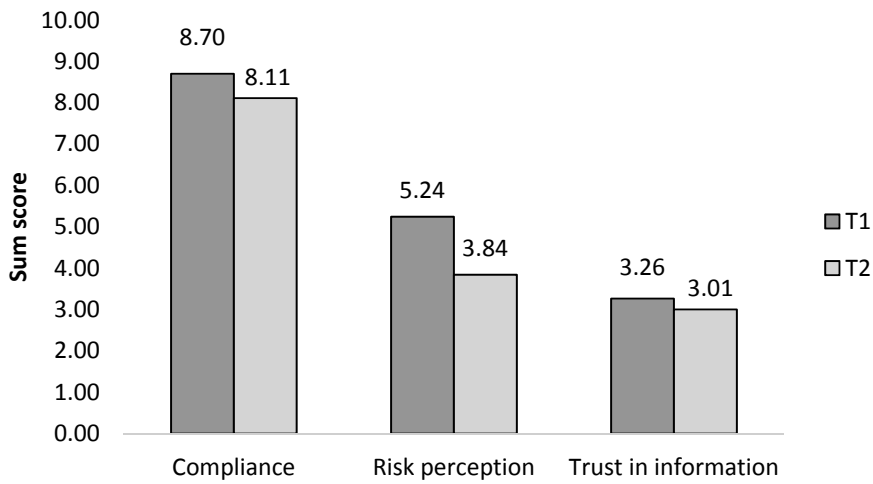

Figure 2. Differences between T1 and T2 for compliance, risk perception and trust in information.

Main Analysis

Risk Perception

Results for regression analysis, in which the criterion variable was risk perception, are presented in Table 2. Regression model was significant for both T1 ($R^2_{ADJ} = .189$; $F(11, 439) = 10.52$, $p < .001$) and T2 ($R^2_{ADJ} = .090$; $F(11, 401) = 4.68$, $p < .001$). Significant predictors in T1 were age, Emotionality, perceived probability of negative life events (UOS-NLE), and trust in information, all in a positive direction. Significant predictors in T2 were age, Emotionality and perceived probability of negative life events (UOS-NLE), in the positive direction, and perceived probability of positive life events (UOS-PLE) in the negative direction.

Table 2
Relationship between risk perception and personality dimensions, unrealistic optimism, age and gender

Predictors	Risk perception T1			Risk perception T2		
	β	*t*	*VIF*	β	*t*	*VIF*
Gender	.03	0.67	1.22	.01	0.16	1.27
Age	.22	4.93**	1.16	.14	2.70**	1.16
Honesty-Humility	-.06	-1.28	1.32	-.09	-1.60	1.32
Emotionality	.27	5.83**	1.23	.16	3.10**	1.24
Extraversion	-.08	-1.62	1.24	-.07	-1.28	1.23
Agreeableness	-.06	-1.24	1.25	.00	0.05	1.26
Conscientiousness	-.01	-0.14	1.26	.06	1.12	1.27
Openness	.03	0.75	1.20	-.02	-0.41	1.19
UOS – PLE	-.09	-1.86	1.25	-.16	-3.12**	1.24
UOS – NLE	.15	3.21**	1.15	.12	2.32**	1.15
Trust in information	.15	3.33**	1.07	.09	1.87	1.09

Notes. UOS – NLE – Unrealistic Optimism Scale – Negative Life Events; UOS – PLE – Unrealistic Optimism Scale Positive Life Events. *t* – value of t-test; *VIF* – variance inflation factor.
* $p < .05$. ** $p < .01$.

Compliance

Results for regression analysis, in which criterion variable was compliance, are shown in Table 3. Regression model was significant for both T1 (R^2_{ADJ} = .168; $F(11, 446) = 9.37$, $p < .001$) and T2 (R^2_{ADJ} = .238; $F(11, 411) = 12.97$, $p < .001$). Significant predictors in T1 were gender and trust in information, both in a positive direction. Significant predictors in T2 were Emotionality, Extraversion, Conscientiousness, perceived probability of negative life events (UOS-NLE), and trust in information, all in a positive direction.

Table 3
Relationship between compliance and personality dimension, unrealistic optimism, age and gender

Predictors	Compliance T1			Compliance T2		
	β	*t*	*VIF*	β	*t*	*VIF*
Gender	.11	2.21*	1.23	.04	0.97	1.26
Age	.01	0.14	1.15	-.01	-0.21	1.16
Honesty-Humility	.02	0.38	1.32	.04	0.87	1.33
Emotionality	.08	1.68	1.24	.15	3.13**	1.23
Extraversion	.05	1.14	1.25	.10	2.14*	1.23
Agreeableness	-.09	-1.87	1.25	-.04	-0.93	1.27
Conscientiousness	.05	1.02	1.25	.15	3.31**	1.27
Openness	.03	0.71	1.20	-.01	-0.29	1.21
UOS – PLE	.07	1.52	1.24	-.01	-0.29	1.24
UOS – NLE	.02	0.53	1.16	.11	2.45*	1.15
Trust in information	.35	7.94**	1.06	.38	8.68**	1.08

Notes. UOS – NLE – Unrealistic Optimism Scale – Negative Life Events; UOS – PLE – Unrealistic Optimism Scale Positive Life Events. *t* – value of t-test; *VIF* – variance inflation factor.
* $p < .05$. ** $p < .01$.

Discussion

Stable individual differences contribute significantly to various behavioral outcomes, and have already been shown to be important for shaping responses to coronavirus pandemic (Brouard et al., 2020). In this study we focused on their role in two patterns of response to COVID-19 pandemic situations: assessment of the risk of getting infected as a form of cognitive-emotional response to the threat, and compliance with protective measures as a form of responsible health behavior in the global health crisis. Since both examined response patterns, the first indirectly and the second more directly, may have a significant effect on the spread of infection and public health, it is important to examine the factors that contribute to these behaviors.

The outbreak of COVID-19 and sudden spread of the epidemic in Serbia led to the mobilization of individuals' psychological resources in order to respond quickly to the novel situation. The results show that both the risk assessment and the compliance with preventive measures were higher at the beginning than at the end of first wave of pandemic, which is consistent with the previous findings that prolonged exposure to threatening circumstances leads to a decline in risk perception due to an increased sense of familiarity (Cowling et al., 2010; Jang et al., 2020; Sadiković et al., 2020). It is also possible that the emergence of new information regarding the nature of the virus and the possi-

bilities of preventing the spread of infection, along with the decreased number of newly reported cases of infection, led to a change in perceived controllability of the situation, and consequently to a decline of perceived risk. However, there is also a decline in the behaviors that should contribute to greater controllability of the situation, suggesting that over time people gradually tend to return to their usual functioning which is more related to their stable characteristics.

Also, a slight decrease of trust in official information over time is found. Since the trust in information has been shown to predict responsible health-related behavior in both this and previous studies (Shepperd et al., 2017), this finding suggests that adequate information of the public in a situation of global health crisis is an extremely important agent of crisis management. Decline in confidence in official information could be due to contradictory information from various sources, impaired credibility of officials due to perceived inconsistencies or decisions attributed to political interests etc. In a situation of increased threat, reduced social activities and other restrictions, such phenomena might particularly attract attention of the public. However, the results of this study do not provide information on the factors that contribute to the decline in trust in official information, and this problem certainly needs to be addressed in future research.

Significant predictors of the risk assessment, both at the beginning and at the end of the first wave of pandemic in Serbia, are age, Emotionality and unrealistic optimism towards negative life events. In the first measurement point, trust in official information is also a significant positive predictor of risk perception, and unrealistic optimism for positive life events appears as a significant predictor in the later phase of the pandemic. While previous findings indicated that older adults perceive the risk of mortality if getting infected as higher, but also the risk of getting infected as lower (Bruine de Bruin, 2020), our results suggest that older participants perceive the higher risk of infection. In general, the predictors of risk assessment are similar in both measurement points, and the role of stable individual differences is limited only to the Emotionality. However, in line with previous findings (Dolinski et al., 2020), unrealistic optimism proved to be a significant predictor of risk assessment both at the beginning and at the end of the first wave of pandemic. People who believe that negative events are less likely to happen to them than to other people tend to underestimate the risk of coronavirus infection. However, unrealistic optimism for positive life events proved to be a significant negative predictor of risk assessment only at the end of the first wave of pandemic. This might be related to changed circumstances – decline in newly reported cases of infection and potentially greater perceived controllability, which is an important condition for optimistic cognitions (Chambers et al., 2003). This is indirectly supported by the finding that unrealistic optimism for positive life events is not linked to adherence to prescribed measures, unlike the unrealistic optimism towards negative life events which significantly predicts risky health behavior. Thus, the belief "good things will happen to me" in the context of a pandemic

differs from the belief "bad things cannot happen to me", in the sense that the former could be viewed as a form of cognitive coping strategy, even somewhat supported by official information at the later stage of epidemic, while the latter can lead to careless and risky behavior that potentially endangers one's own and others' health.

The compliance with recommended measures at the beginning of the pandemic is not related to personality traits. Women adhere to protection measures more, which is in line with previous findings (Abdelrahman, 2020; Gaygisiz et al., 2011). People who had more confidence in the official information regarding pandemic comply with the protective measures more, which is an expected result since trust in certain sources of information is the basis for accepting recommendations and requests that most often come from the same sources. However, at the end of the first wave of the pandemic, individual differences in personality traits and unrealistic optimism stand out as significant predictors of the degree of adherence to prescribed measures. Thus, in spite of the very limited role of personality traits in risk perception, especially in the initial phase of the pandemic, their contribution to explaining compliance with protective measures is significant at the end of the first wave of the pandemic. In particular, Emotionality, Extraversion, Conscientiousness and unrealistic optimism towards negative life events significantly contribute to the degree of adherence to protective measures at the end of the first wave of pandemic.

The contribution of Emotionality, which significantly predicts risk perception both at the beginning and at the end of the first wave of pandemic, as well as the degree of adherence to protective measures at second measurement point, may be due to a higher degree of emotional reactivity, resulting in the more intense perceived threat. This result is consistent with previous findings suggesting a link between Neuroticism and preventive behaviors (e.g., Abdelrahman, 2020).

Extraversion significantly predicts compliance with protective measures at the end of the first wave of pandemic. This could be related to the proactive approach of people scoring higher on Extraversion and is in line with previous findings (Carvalho et al., 2020). Although high Extraversion could hypothetically be associated with reduced tolerance to social distancing (which is one of the most important preventive measures recommended), it seems that extraverted people find ways to satisfy the need for communication that do not affect their willingness to adhere to prescribed protective measures. Anticipation of positive outcomes of protective behaviors probably motivates extraverted individuals to comply with measures. The contribution of Conscientiousness, which is also indicated by previous findings (Abdelrahman, 2020; Carvalho et al., 2020), probably stems from self-discipline, caution and prudence, as well as the general tendency of conscientious individuals to act responsibly regarding their own and other's health (Bogg & Roberts, 2004).

Contrary to expectations, the traits Agreeableness and Honesty-Humility, which directly refer to prosocial tendencies (Ashton & Lee, 2008) and recip-

rocal altruism (Zettler et al., 2020), did not significantly predict the behavior in a pandemic situation. Adherence to preventive measures can be seen as a form of care for other people and the community. However, in circumstances where measures are prescribed or mandatory, compliance with them might be better understood in terms of response to requests, as well as assessed consequences of non-compliance. Therefore, emotional personality characteristics that are important for risk perception and anticipation of outcomes, and the general tendency to adhere to rules and behave responsibly, proved to be more relevant for the prediction of this behavior.

Overall, the results point to several conclusions. First, risk assessment, the degree of adherence to preventive measures and trust in official information decline over the course of pandemic, which can be important information for further efforts in controlling the spread of infection. Secondly, the total contribution of personality traits to behavior in a pandemic is not high, which is understandable given the multiple determinants of human behavior. In the situation of the global health crisis, which poses similar and rather strong challenges for all those exposed to it, the somewhat weakened contribution of stable dispositions is quite expected. Still, personality traits have shown to play significant role in pandemic behavior. They generally show little contribution to shaping cognitive-emotional and behavioral responses at the beginning of the COVID-19 pandemic in Serbia, suggesting that the new situation dampens the effects of stable individual differences. However, consistent with the set-point theory of well-being (Bonnano, 2004), at the end of the first wave of the pandemic they prove to be more relevant for predicting the degree of adherence to prescribed protective measures - Emotionality, Conscientiousness and Extraversion significantly predict the tendency to comply with these measures. In addition, the results indicate the importance of adequately informing the public and increasing trust in the accuracy of information for people's behavior in the global health crisis. Finally, unrealistic optimism proves to be important in predicting both risk assessment and compliance with recommended preventive measures. The findings specifically indicate the role of unrealistic optimism towards negative life events in lower compliance with the prescribed measures as a form of risky behavior in the pandemic circumstances.

This study has several limitations which may affect the generalization of the results. First, online studies mainly include samples of volunteers that have access to the Internet and who meets the WEIRD criteria (for more information see Henrich et al., 2010). Therefore, there is a risk that these participants do not represent the entire population. However, the examination of older family members partially solved the typical problems of such studies, including respondents of different ages and lifestyles. Second, since the UOS did not include a clear criterion for assessment of prediction accuracy, such as comparing predictions to outcomes, it is possible that encompassed optimistic bias, which is not entirely unrealistic. Given that unrealistic optimism was assessed as a stable predisposition, it is possible that the assessment of this cognitive

bias would have been different if the items had been adjusted to circumstances such as the COVID-19 pandemic. Third, trust in information was assessed using only one item. Therefore, greater reliability of this measure would be achieved by introducing a questionnaire that would cover the phenomenon in a more grounded way.

Nevertheless, our results have important implications for future public health strategy, which includes preventive measures. First, health policy makers must keep in mind that the factors that contribute to responsible preventive behavior can have different origins. Individual differences, such as personality traits and people's propensity for unrealistic optimism, contribute to risk perception and acceptance of preventive measures. Moreover, trust in official information, as an important factor in prevention, can be enhanced by transparent and regular public information, which must include educating the population about adequate health behavior. Second, a key moment in adequate public health prevention is the very beginning of a pandemic, when stable individual differences are less pronounced and when most people act in accordance with the recommendations.

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Appendix

Appendix A

A More Detailed Description of the Sample

Sample used in this research was collected by second-year psychology students. Each student had the task to invite 2 to 3 members of the family and 3 friends or relatives to participate in the study. Participation was voluntary, and each participant provided informed consent. The sampling procedure was approved by the institutional Ethics Committee. Out of 35 participants who dropped out of the research between the first and sixth week, there were 18 female and 17 male participants, and their mean age was 28.51 years (*SD* = 14.13).

Appendix B

Table A
Descriptive statistics and correlation for all used measures.

Measure	*M*	*SD*	*Sk*	*Ku*	1	2	3	4	5	6	7	8	9	10	11	12	13
Compliance T1 (1)	8.7	1.5	-1.19	1.25													
Compliance T2 (2)	8.1	1.9	-0.96	0.33	.669**												
Risk Perception T1 (3)	5.3	1.9	0.34	-0.49	.184**	.169**											
Risk Perception T2 (4)	3.8	1.9	1.13	0.87	.105*	.208**	.664**										
Honesty-Humility (5)	58.3	10.9	-0.63	0.25	.044	.100*	.035	.009									
Emotionality (6)	52.8	10.1	0.03	-0.22	.160**	.197**	.306**	.182**	.070								
Extraversion (7)	54.3	10.9	-0.35	0.06	.088	.110*	-.116**	-.107*	-.067	-.125**							
Agreeableness (8)	47.9	10.7	-0.20	-0.20	-.054	.021	-.092*	-.049	.318**	-.115**	.074						
Conscientiousness (9)	58.1	10.2	-0.47	0.04	.137**	.241**	.005	.002	.196**	.062	.249**	.143**					
Openness (10)	57.3	11.2	-0.44	-0.19	.041	.031	-.023	-.049	.061	-.047	.135**	.115**	.188**				
UOS - PLE (11)	36.9	7.2	-0.35	0.51	.125**	.080	-.140**	-.177**	-.071	-.012	.334**	.102*	.269**	.161**			
UOS - NLE (12)	12.6	4.3	0.09	-0.88	.010	.073	.186**	.149**	-.032	.066	-.173**	-.128**	-.145**	.209**	-.151**		
Trust in information T1 (13)	3.3	1.2	-0.31	-0.74	.372**	.357**	.166**	.145**	.100*	.096*	.084	.082	.148**	-.040	.082	-.056	
Trust in information T2 (14)	3.0	1.3	-0.09	-0.96	.243**	.417**	.110*	.099*	.112*	.068	.057	.147**	.167**	-.045	.107*	-.048	.659**

Note. M –mean; *SD* – standard deviation; *Sk* – skewness; *Ku*– kurtosis; UOS–NLE – Unrealistic Optimism Scale – Negative Life Events; UOS–PLE – Unrealistic Optimism Scale - Positive Life Events. Numbers under diagonal, in the right part of the table, are bivariate correlation between pairs of measures.
* $p < .05$. ** $p < .01$.

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NEREALISTIČNI OPTIMIZAM I DIMENZIJE HEXACO MODELA LIČNOSTI KAO PREDIKTORI PERCEPCIJE RIZIKA I POŠTOVANJA PREVENTIVNIH MERA TOKOM PRVOG TALASA PANDEMIJE COVID-19

Ciljevi ovog istraživanja bili su ispitivanje potencijalnih razlika i faktora koji doprinose percepciji rizika i poštovanju preventivnih mera na početku (T1) i na kraju (T2) prvog talasa pandemije COVID-19. U istraživanju je učestvovalo 423 ispitanika (*M* = 30.29, *SD* = 14.45; 69% ženskog pola). Poštovanje mera, percepcija rizika i poverenje u informacije bili su značajno viši u T1 u poređenju sa T2. Značajni prediktori percepcije rizika u T1 i T2 bili su Emocionalnost (HEXACO-PI-R) i Nerealistički optimizam (NLE – Negativni životni događaji). Poverenje u informacije je bilo značajan prediktor u T1, dok je Nerealistički optimizam (Pozitivni životni događaji) bio značajan prediktor u T2. Kada je u pitanju poštovanje preventivnih mera, značajni prediktori u T1 su bili pol i Poverenje u informacije, dok su i u T1 i u T2 značajni prediktori bili Emocionalnost, Ekstraverzija i Savesnost (HEXACO-PI-R), NLE i Poverenje u informacije. Generalno posmatrano, rezultati ukazuju na to da je uloga osobina ličnosti u razumevanju poštovanja zaštitnih mera, bila važnija na kraju prvog talasa pandemije u odnosu na njen početak. Još jedan od zaključaka jeste da je Nerealistični optimizam (NLE) više izražen kod osoba koje su u manjem stepenu poštovale preporuke u vezi sa zaštitnim merama.

Ključne reči: COVID-19, HEXACO, nerealistični optimizam, percepcija rizika, poštovanje zaštitnih mera

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PSYCHOLOGICAL WELL-BEING IN STUDENTS DURING SELF-ISOLATION DUE TO THE COVID-19 PANDEMIC

The COVID-19 pandemic resulted in lock-down measures being imposed by the government of North Macedonia. Conditions of self-isolation have direct effects on mental health. We researched the possible protective factors of psychological well-being. A total of 510 college students from the biggest university in the country (70% females, M_{age} = 21.12 years, *SD* = 1.58) responded to a structured online questionnaire, one month after the country's lock down. Multiple linear regression analysis was performed on hypothesized protective factors of well-being. Results showed that significant predictors of the psychological well-being in conditions of isolation are: perceived social support during self-isolation, self-engagement in physical exercises, perception of being adequately informed about the virus and the ways of protection, and the tendency to hold conspiracy explanations about the virus and pandemic. Perception of medical and restriction of movement measures, together with self-engagement in reading /watching movies, were not significant predictors. In the face of the expected further difficulties with the pandemic, policy creators and the scientific community should develop well-thought out strategies, tailored to different groups, in order to provide appropriate support to people to cope with pandemic, to adequately communicate the necessary medical and restriction measures and all important information about the virus and pandemic, especially in order to manage with the complex role of the conspiracy theories which could undermine confidence in the health system.

Keywords*:* conspiracy theories, COVID-19, protective factors, psychological well-being, self-isolation

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Introduction

In December 2019, a novel virus (SARS-CoV-2) was identified in China and soon spread across the world. In order to prevent further spread of the disease, most of the governments-imposed lock-down measures of different scopes. The situation in North Macedonia did not significantly differ. In order to reduce contact between people, and thus prevent further spread of the disease, most of the governments, aside from hygiene-related recommendations, based their approaches on securing social distancing between people, especially for populations under higher risk. This approach was mostly based on imposing lock-down measures of different scopes. The situation in North Macedonia did not significantly differ, either in imposed measures, or in figures about infected and fatal cases (per capita). National crisis authorities announced lock-down measures on March 11, which lasted until mid-June, closing educational institutions at all levels, as well as non-essential industries, imposing a curfew of variable length, and making a strict demand for self-isolation.

Such prolonged self-isolation is a severe change, which frustrates and disrupts many people's needs and daily routines. Drawing on experiences from previous pandemics, Brooks et al. (2020, p.1), in January 2020, emphasized the importance of studying the impact of quarantine on mental health, predicting the potential risk of increases in "posttraumatic stress symptoms, confusion, and anger". Studies on general population samples, soon confirmed that the spread of the coronavirus and quarantining had negative psychological impacts globally, from China (Qiu et al., 2020; Wang et al., 2020; Zhang & Ma, 2020), to Italy (Rossi et al., 2020) and Croatia (Lauri Korajlija & Jokic-Begic, 2020). Nevertheless, findings about the psychological effects of self-isolation on the college students' population are not coherent. Studies on college samples reported that pandemic has low to medium effects on psychological well-being and mental health. While Li et al. (2020) reported significant increase in anxiety and depression symptoms in college students in China, Cao et al. (2020) on another college student sample in China found that only 0.9% had severe anxiety symptoms, 2.7% had moderate anxiety and 21.3% experienced mild anxiety. Liang et al. (2020) found that the rate of psychological help-seeking was low, with college students in poor psychological condition seeking psychological counselling more. Elmer et al. (2020) conducted a longitudinal study on college sample in Switzerland, investigating the mental health of the participants before and after the pandemic. The authors found that students' levels of stress, anxiety, loneliness, and depressive symptoms got worse, compared to measures before the crisis. In the United States Kecojevic et al. (2020) found that students experienced increased levels of anxiety, depression and academic difficulties, while Son et al. (2020) found that lock-down measures and self-isolation restrictive measures have moderate negative impact on students' mental health. In Ethiopian college students' sample, Aylie et al. (2020) found moderate rates of depression, anxiety, and stress of 21.2%, 27.7%, and 32.5%,

respectively - as a result of the pandemic. Sundarasen et al. (2020) conducted a study on Malaysian college sample and reported that 20.4%, 6.6%, and 2.8% of participants respectively - experienced minimal to moderate, significant, and extreme levels of anxiety.

Whereas negative effects of self-isolation on psychological well-being are already well documented, research on factors that could protect and contribute to well-being is scarce. Knowing that well-being influences health (Diener et al., 2017) and contributes to the boosting of the immune system, makes exploring the predictors of well-being during the pandemic even more important.

Psychological Well-Being during Self-Isolation

The conceptualization of well-being has a long history. Aristotle considered flourishing as the ultimate goal of human existence (Robinson, 1989). Flourishing is understood as the relative absence of experiences of suffering in life, and the relative presence of positive ones (Seligman & Csikszentmihalyi, 2000). In recent years, Seligman's theory of well-being (2011; 2018) has enriched the field, encompassing fundamental elements of life that people pursue and value for their own sake. The five components of psychological well-being in his theory are: positive emotional experiences (P), engagement (E), positive relationships (R), meaning (M), and competent achievement (A). *Positive Emotion* refers to the affective component or feeling well, *Engagement* denotes the deep psychological involvement in a valuable activities, *Relationships* component deals with the perception of quantity and quality of social connections, *Meaning* reflects to personal sense of significance in regards to own life and, finally, *Accomplishment* refers to success, as self-evaluated, in reaching both external and internal goals.

Lock-down measures and self-isolation due to COVID-19 pandemic may pose severe challenges and obstacles to the fulfilment of these components of well-being. In a study that Main et al. (2011) conducted on college students during the SARS outbreak in 2003, they found that participants' psychological well-being was influenced by several factors: their perception on how well they are informed about the pandemic; how they perceive and react on governmental measures of restriction of movement; and, how they perceive and react on medical protocols (for prevention of disease spread). They concluded that proactive behaviour toward these measures, as well as the adequate social support during self-isolation - served as adaptive factors in coping with SARS-related stressors and contribute to psychological well-being. Lyubomirsky et al. (2005) and Ryan and Deci (2017) have provided empirical evidence that intentional, deliberate engagement in personally meaningful activities contribute to sustainable psychological well-being, and such activities could be behavioral (e.g., sports), volitional (e.g., striving to achieve a personal goal) or cognitive

(e.g., reading, studying). Furthermore, based on data from previous epidemics, Brooks et al. (2020) concluded that information is crucial for the people during the self-isolation. People need to be adequately informed about the virus and pandemic, and how to be protected. In a situation like COVID-19 pandemic, media are overflown by various information about the origin of the virus and about the spread of the disease, with overproduction of conspiracy explanations. People variously process and handle with that enormous quantity of information, with some of them believing more in official authorities' statements, and some tend to accept and believe conspiratorial explanations (Groh, 1987). Considering these aspects, the focus of our interest in this study were several cognitive and behavioural factors related to conditions in self-isolation due to pandemic, which could affect fulfilment of the components of psychological well-being. Those factors are: the perceived social support during self-isolation; perception of governmental measures for restriction of movement, as well as the medical measures - as beneficial; self-engagement in physical exercises and reading or watching movies; perception of being adequately informed about the virus and ways of protection, and what explanations about the virus and pandemic people accept and develop as their personal beliefs.

To have appropriate social support and fulfilled basic need for relatedness is beneficial to someone's psychological well-being, what is documented in various cultures (Church et al., 2013; Reis et al., 2000; Seligman, 2011), as well as on Macedonian college students (Spasovski, 2013). Perception of receiving adequate social support could specifically mitigate the negative influence of anxiety in a crisis like the COVID-19 pandemic (Cao et al., 2020). Son et al. (2020) on USA students sample found that lack of social interaction and social support during the self-isolation due to COVID-19 pandemic is related to decrease in well-being. Similar findings reported Elmer et al. (2020) in a longitudinal study on Swiss sample of undergraduates.

Reynolds et al. (2008) pointed out that lock-down measures frustrate people's needs and daily routines, while Brooks et al. (2020) noted that most of the adverse effects in quarantine come from the restriction of liberties. Consequently, if people perceived lock-down restrictions and protocols as beneficial for their safety and health, it could lead them to comply with the measures. Such a reaction is expected to be related to lower levels of distress, it could provide meaningful explanation when facing the restrictions in daily routines, and could finally contribute to a sense of overall well-being (Deci & Ryan, 2000; Seligman, 2011). In a study conducted in US on a college students in self-isolation due to the COVID-19 pandemic, Kecojevic et al. (2020) found that complying with the medical measures, as well as with the measures for social distancing - as prevention from infection - was positively related to participants' well-being. In our study, we are focused on the possible relationship between the perceiving the measures as beneficial and psychological well-being. We differentiate two types of measures: the medical measures - meaning complying with the recommendations coming from medical/health

authorities for frequent hands washing, sanitizing and disinfecting surfaces; and, measures imposed by the government for restriction of movement, social distancing and self-isolation.

Psychological well-being could be also influenced by the way how people occupy their time during self-isolation. Lyubomirsky et al. (2005) and Ryan and Deci (2017) have shown that intentional, deliberate engagement in physical exercising and reading could contribute to sustainable psychological well-being. Lades et al. (2020) provided similar results on an Irish sample of general population during the COVID-19 pandemic.

During every crisis in the society, like pandemic is, people face with uncertainty and unanswered questions (Groh, 1987). In their review on psychological effects of quarantining due to epidemics on well-being, Brooks et al. (2020) point out that information is a key factor for people. The deficit of quality and reliable information about important situations produces stress and a lack of clarity, which leads people to fear the worst (Desclaux et al., 2017; Reavley et al., 2011). Therefore, a personal sense of being adequately informed about the crisis reduces stress, and provides meaning about the actual circumstances, which ultimately contributes to well-being (Seligman, 2011).

Every pandemic produces the fear of being infected and creates anxiety due to the ensuing uncertainty about the future. For many people it is difficult to find acceptable answers, especially in a situation which is complex and hard to understand. Countless theories about the origin of the SARS-CoV-2 virus and the reasons how it spreads were generated, especially on social media. Grzesiak-Feldman (2013) pointed out that high-anxiety situations increase conspiracy thinking, making people more prone to blame some individuals, group(s) or institution(s). A conspiracy theory is defined as the conviction that a group of actors meets in secret with the purpose of attaining some malevolent goal (Bale, 2007). Conspiracies are involved in almost every significant event in society (Groh, 1987; Moscovici, 1987). It is often reported in the scientific literature that conspiracy beliefs have harmful consequences for social life, such as decreasing engagement with politics and influencing people's health and environmental decisions (Douglas et al., 2015), as well as influencing their attitudes, intentions, and behaviors (Douglas & Sutton, 2018). They may provoke political polarizations among people and science denialism, and may lower intention to remain in the workplace (Jolley et al., 2020). In another study, Chen et al. (2020) reported that social workers who believe in COVID-19 conspiracies show lower levels of mental health. Acceptance of conspiracy theories is also related to a belief in the world as a dangerous place or as a competitive jungle (Lantian et al., 2020).

Considering such negative consequences of conspiracy beliefs, it is intriguing why they exist in high proportions among the people? According to Douglas and Sutton (2015), almost half of the American citizens believe in some conspiracy theory. Searching for an answer, many authors have investigated some possible beneficial aspects of conspiracy beliefs (for detailed review see: Bale

2007; Goertzel 1994; Leman 2007; van Prooijen, 2018). Van Prooijen and van Vugt (2018) suggested that conspiracy beliefs have roots in evolution. They may be a by-product of several psychological adaptations: to recognize patterns, as in COVID-related events; or, to detect agency (like the belief that some organizations, firms or institutions intentionally spread the virus in order to reap profits from the sale of vaccines, or even to inject nano-chips in human bodies). Alternatively, the inclination toward conspiracy beliefs is seen as an evolved adaptive mechanism of the human coalitional mind, serving to alert our ancestors to the possibility that other people were making malevolent coalitions against them, and consequently urge them to appropriately prepare for defence. It could be concluded, that contrary to the interpretation that holding conspiracy beliefs is pathological (Hofstadter, 1966), such beliefs are in fact omnipresent both in modern and traditional societies (West & Sanders, 2003), and that a great part of the human population believes such explanations because they provide simple answers for otherwise unanswered questions, and an enemy to blame for the problem (Goertzel 1994). Conspiracy beliefs help people to explain anxiety-inducing events, and thus allows them to retain a sense of safety and predictability (Bale 2007; Leman 2007). Built on these assumptions, we were focused on potential relation between believing in COVID-19-related conspiracy explanations and well-being during the pandemic.

Study Aims

Differently to the majority of studies focused on the negative factors of self-isolation on mental health, the aim of this original empirical study was to examine factors that contribute to psychological well-being under the conditions created by the lock-down measures and self-isolation due to the COVID-19 pandemic. On the basis of previous research findings, it is justified to expect that the perception of adequate social support during self-isolation, perception of governmental medical measures and measures for restriction of movement as beneficial, self-engagement in physical exercises and reading or watching video contents; perception of being adequately informed about the virus and ways of protection, and tendency to hold conspiracy explanations about the SARS-CoV-2 virus and pandemic, contribute to psychological well-being in students.

Method

Sample and Procedure

The convenience sample was comprised of undergraduate students from four randomly selected faculties (Philosophy, Architecture, Information Technologies and Mechanical Engineering), from the biggest state university in the

country. They were all contacted via their student email accounts. 510 students (31% response rate, 70% female, M_{age} = 21.12 years, *SD* = 1.58, age range = 18-28) volunteered to complete the survey. The vast majority of respondents (91%) declared themselves to be ethnic Macedonians, 2.7% to be ethnic Serbs, 2.5% to be ethnic Albanians and the remaining 3.8 % to be of either Roma, Turkish, Vlach or Bosniak ethnic backgrounds. There were no significant variations in the isolation–related conditions of the respondents during the period of data collection. Majority of them were in isolation at their homes (96.3%), with 87.3% of them being in isolation together with their parents or other relatives, and less than 20% were in isolation for a period shorter than three weeks. According to the provided answers, none of the participants was infected by Sars-Cov-2. Also, the vast majority of them (97.4%) did not have a relative or acquaintance infected by Sars-Cov-2.

All subjects participated on a voluntarily basis, without any incentive. The informed consent for their anonymous participation was obtained by accepting the explanations on the purpose of the study and the conditions presented in an introductory text sent to their e-mail addresses. The access to the participant's e-mail addresses was approved by the relevant authorities. The collection of data took place from April 10th - 18th, 2020, one month after the country's complete lock down.

The research design and procedure are in accordance with the APA ethical principles for human research, recognized by the Psychological Chamber of the Republic of North Macedonia. The authors were not granted any financial support for this research. The data that support the findings of this study are openly available in figshare, at https://doi.org/10.6084/m9.figshare.12480350.v1 (Spasovski & Kenig, 2020).

Instruments

Questionnaire on Well-Being Protective Factors in Isolation

The questionnaire was constructed specifically for the purpose of this study, consisting of questions on both the relevant socio-demographic and contextual characteristics (location in which they were self-isolated and with whom, and length of self-isolation) along with the variables hypothesized to be connected with different aspects of psychological well-being: 1. Explanations of the origin of the COVID-19 pandemic, 2. Perception of the official medical (PMM) and restriction of movement measures (PMM) with six items, on a scale from 1-complete disagreement to 4-complete agreement, 3. Perceived level of social support during the evaluated period of isolation (PSSI), 4. Self-evaluation of how adequately one is informed about the virus and how to protect oneself from getting infected and (PAI) 5. Self-engagement with protective meaningful activities - physical exercises (SEPE) and reading/watching movies

(video contents) (SERM). The last three variables were self-assessed on a scale ranging from 1-*poor* to 4-*very good*.

In order to determine the most frequent conspiracy theories that college students use to explain the current pandemic, prior to administering the questionnaire online, we conducted six focus-groups with 46 students in total. They were selected from the target population and separated in 6 different groups, according to study year, gender and field of study/faculty. These participants didn't take part in the collection of quantitative data. The thematic analysis of the statements provided by the participant in the focus groups identified nine different explanations that were consequently organized into two categories: 1. *Conspiracy theories* (which include the following explanations: that the virus has been deliberately spread as a means of creating an economic crisis, or for the sake of the profits of Big Pharma; that it is a consequence of installing 5-G nets; that it is a form of manipulation for the sake of either controlling, or inserting chips into people; and finally that it is a laboratory experiment that has not been well controlled), 2. *Non-conspiracy explanations* (that the pandemic is a result of either huge class differences, or the result of nature's ecological imbalance, a natural occurrence, probably a mutation of the SARS-CoV-2 virus or a consequence of skewed values). Thus, a dichotomous variable *Explanations about the virus and pandemic* (EAV) was created, with 240 (47.1%) responses classified in the first category, and 251 (49.2%) in the second one. The responses of 19 participants (3.7%) could not be classified and were omitted from the analysis.

The PERMA-Profiler

The second part of the survey was comprised of the 23 PERMA-Profiler items (Butler & Kern, 2016), which is a self-reported multi-dimensional instrument based on Seligman's (2011) model of defining well-being. Each item is scored on a Likert-type scale from 0 (not at all) to 10 (completely), or 0 (terrible) to 10 (excellent), where higher scores indicate greater well-being and vice versa. It has 7 subscales: *Positive Emotion (P), Engagement (E), Relationships (R), Meaning (M), Accomplishment (A)*, perceived *Health (H)* and the *Negative Emotion* subscale (along with a single item for *Loneliness*). The last two subscales were not part of our research. The Overall well-being PERMA score is a mean of all PERMA items and the single item for happiness. The Cronbach alpha coefficients of internal consistency of all subscales, as well for the overall scale for the current sample are generally acceptable and are presented in Table 1.

Data Analytic Plan

Descriptive statistics were calculated for all PERMA subscales, including Overall well-being and for the protective factors of well-being. Taking into account the levels of measurements of the other included variables, we used either Pearson or point-biserial correlations, in order to test the hypothesized relations between the measures we got for factors of well-being in self-isolation, and the level of psychological well-being. We than used a multiple regression analysis in order to establish a model of prediction of psychological well-being based on protective factors as predictors. The statistical analysis was performed by using the IBM SPSS Statistics (Version 17).

Results

Table 1 contains detailed, descriptive information on the included continuous variables in the study. As seen from the reported averages, participants exhibited a strong tendency towards reporting considerably high levels on all but one measure - Self-engagement with physical activities.

Table 1
Descriptive statistics for the included continuous variables (n = 510)

	M	*SD*	*Mdn*	*Min*	*Max*	*N*	α
PERMA							
Positive emotion	6.38	2.05	6.67	0.00	10.00	3	.86
Engagement	7.26	1.77	7.67	0.33	10.00	3	.56
Relationships	7.26	2.11	7.67	0.00	10.00	3	.78
Meaning	6.96	2.22	7.33	0.00	10.00	3	.86
Accomplishment	6.33	1.91	6.67	0.33	10.00	3	.74
Overall Well-Being	6.85	1.64	7.12	0.94	10.00	18	.92
Perception of medical measures	3.41	0.64	3.67	1.00	4.00	3	.84
Perception of the restriction of movement measures	3.29	0.82	3.67	1.00	4.00	3	.90
Perceived social support in isolation	3.28	0.86	3.50	1.00	4.00	1	-
Perceived adequacy of being informed about the virus	3.64	0.64	4.00	1.00	4.00	1	-
Self-engagement with reading / movies	3.75	0.53	4.00	1.00	4.00	1	-
Self-engagement with physical exercises	2.70	1.03	3.00	1.00	4.00	1	-

Note. M – mean; *SD* – standard deviation; *Mdn* – Median; *Min/Max* – minimal and maximal score; *N* – number of items; α – Cronbach's reliability coefficient.

Table 2 shows the relationship between the PERMA components and different variables hypothesized as being supportive factors for well-being during self-isolation. Overall well-being is significantly related to all of them except Self-engagement with reading and watching movies. The strongest correlations were those with Perceived social support and Self-engagement with physical activities.

Table 2
Correlation coefficients of PERMA components with the protective factors of well-being

	PSSI	PAI	SERM	SEPE	PMM	PRM	EAV[a]
N	510	510	510	510	510	510	491
Positive emotion	.32**	.14*	.03	.29**	.10*	.08	-.11*
Engagement	.18**	.02	-.00	.19**	.14**	.12**	-.12*
Relationships	.43**	.09*	.03	.17**	.13**	.14**	-.08
Meaning	.28**	.15**	.08	.29**	.12**	.09*	-.13**
Accomplishment	.22**	.13*	.03	.32**	.11**	.07	-.10*
Happiness	.30*	.10*	.02	.23**	.11**	.03	-.07
Overall Well-Being	.37**	.15**	.04	.32**	.14**	.12*	-.13**

Notes. PSSI - Perceived social support during self-isolation; PAI - Perception of being adequately informed about the virus and ways of protection; SERM - Self-engagement in reading/movies; SEPE - Self-engagement in physical exercises; PMM - Perception of medical measures as beneficial; PRM - Perception of governmental restriction of movement measures as beneficial; EAV Explanations about the virus and pandemic.
[a]The variable was dichotomized and coded as: 0 - non-conspiracy explanations and 1 - conspiracy beliefs.
* $p < .05$. ** $p < .01$

Multiple regression analysis (enter method) was applied to examine the significance of different protective factors of psychological well-being during self-isolation as predictors of overall well-being. The visual inspection of scatterplots confirmed the relationships between the predictors and outcome variables were linear. The possibilities for collinearity of predictor variables were also excluded on the basis of their mutual correlations and the values of collinearity statistics. Both the PP normal plot and the scatterplot suggest that the assumptions for performing the multiple regression analysis are satisfied. Only one case exceeds the residual standardized values of ±3.3.

Table 3
Summary of enter method multiple regression analyses for protective factors in isolation predicting the overall wellbeing

	B	*SE*	*β*	*t*	*p*
Perceived social support during self-isolation	.64	.08	.34	8.32	.001
Perception of governmental medical measures as beneficial	.10	.12	.04	0.79	.43
Perception of governmental measures for restriction of movement as beneficial	.06	.10	.03	0.59	.56
Self-engagement in physical exercises	.43	.06	.27	6.89	.001
Self-engagement in reading/movies	.03	.12	.01	0.21	.83
Perception of being adequately informed about the virus and ways of protection	.42	.10	.16	4.12	.001
Explanations about the virus and pandemic [a]	-.36	.13	-.11	-2.84	.001

Note. [a]The variable is dichotomized and coded as: 1 - conspiracy beliefs about the virus and pandemic, 2 - non-conspiracy beliefs about the virus and pandemic.

According to the obtained results (Table 3), the tested model is significant (R^2 = .28, $F(7, 490) = 26.34$, $p < .01$), accounting for 27.6% of the variance in overall wellbeing. Three of the seven included variables do not significantly contribute to the model. The perception of both medical and restriction of movement measures, together with self-engagement in reading /movies did not made significant contributions to the prediction of the overall well-being. The analysis suggests that four of the hypothesized protective factors positively predict the overall well-being: perceived social support during self-isolation, self-engagement in physical exercises perception of being adequately informed about the virus and the ways of protection, and the tendency to hold conspiracy explanations about the virus and pandemic.

Discussion

People cope differently with the fear, stress and constraints that come along with the COVID-19 pandemic and self-isolation. We found that students-participants in our study reported levels of all aspects of well-being according to PERMA model similar to the most frequently reported means for overall well-being in various samples, in times when there were no global threats like the current pandemic (Butler & Kern, 2016).

Results from the regression analysis showed that perceived social support during self-isolation, self-engagement in physical exercises, perception of being adequately informed about the virus and the ways of protection, and

the tendency to hold conspiracy explanations about the virus and pandemic significantly predict the psychological well-being in conditions of self-isolation. Perception of medical and restriction of movement measures, together with self-engagement in reading /watching movies (video content), have no significant contribution. The finding about the role of perceived social support is in accordance with the literature before the pandemic crisis (Church et al., 2013; Seligman, 2011), but also with the findings from studies conducted during the COVID-19 pandemic - on samples in self-isolation (Elmer et al., 2020; Son et al, 2020). The majority of the participants in our study were self-isolated at home with their family or relatives, what may serve as a buffer against the negative influences that the pandemic-induced anxiety created (Cao et al., 2020). In sum, the results confirm and emphasize how important the social support is in times of crisis. Another significant contributor to psychological well-being was engagement in physical activities, or exercising. Our results supported the idea that, especially in times of uncertainty, occupying time with meaningful actions, like physical activities, reduced anxiety and contributed to better emotional well-being (Lades et al. 2020; Lyubomirsky et al., 2005; Ryan & Deci, 2017). Unexpectedly, engagement in reading or watching movies and video contents was not significant predictor of well-being, with a possible reason in the fact that the vast majority of respondents were regularly engaged in such activities, which resulted in little to no significant variations between them.

Intriguingly, perception of medical measures and measures for restrictions of movement as beneficial were not significant contributors of well-being in the prediction model, what is not in accordance with the recent study conducted on students' sample in self-isolation due to COVID-19-pandemic (Kecojevic et al., 2020) which show that complying with the medical measures, as well as with the measures for social distancing - as prevention from infection - was positively related to participants' well-being. Given that such measures frustrate many daily routines, it could be assumed that they were not communicate in an effective way in order our participants to perceive them significantly beneficial. Considering that the sample in this study had significant proportion of participants who believed in some conspiracy explanation(s) about the SARS-CoV-2 virus and pandemic, another possible explanation for these results is that they perceive the measures as unjustified, especially when they produce many constrains to their daily routines.

Speaking about communication, our findings supported the assumption that information plays an important role in coping with the adversity of the pandemic, and that people's well-being in quarantine depends on their understanding of the situation (Brooks et al., 2020). Perception of being adequately informed about the virus and how to protect from infection was shown as significant contributor to psychological well-being. The highest correlation was found for the *meaning* component of well-being, which supports the assumption that the feeling of being adequately informed about the crisis helps

one better adapt to the current circumstances and reduces the uncertainty and stress.

The role of information is especially important in situation like COVID-19 pandemic - associated with uncertainty about the future. Such situations rise many questions about various aspect of the threat which people need to understand, followed by production of numerous explanations, with and without scientific support. The question how people process information and explanations during the pandemic is of high importance, because it appears that we live in a time in which we are exposed to more conspiracy theories than ever (Leman, 2007). Our findings support the assumption that believing in conspiracy theories is significant contributor to psychological well-being. One well documented argument for this assumption in the literature is that conspiracy beliefs help people to explain high-anxiety negative events and to retain a sense of safety and predictability, and that conspiracy beliefs might actually serve as a kind of protective mechanism in such tensed situations (Bale, 2007; Grzesiak-Feldman, 2013; Leman 2007). The results in our study showed that students who believed in conspiracy explanations, had higher levels of well-being compared to participants who believed that the virus outbreak is a natural occurrence or some kind of response to inequalities or overconsumption. Similar effects were also found for *meaning* as a component of well-being. These findings supported the interpretation that when people are faced with a threating situation (virus, pandemic) and with various competing explanations about them, some will be attracted by conspiracy theories which seem to provide best answer to the unknown (Goertzel 1994). "Knowing" the answer provides meaning in face of the threat of crisis event and reduction in anxiety, and further contributes to psychological well-being. The positive relation between conspiracy beliefs and subjective, psychological well-being, could be one of the possible reasons why such beliefs exist in such a large part of population, or, why they are universal and omnipresent (West & Sanders, 2003). Such results indicate the very complex role of believing in conspiracy explanations and their impact on emotional, cognitive and behavioural outcomes on individual and collective level. Although conspiracy beliefs have harmful consequences for social life, people's health and environmental decisions and harmfully influence their attitudes, intentions, and behaviors (Douglas et al., 2015; Douglas & Sutton, 2018; Jolley et al., 2020), we see that they may serve as a vent for anxiety on individual level and may contribute to psychological well-being. These results should not be understood in a way that conspiracy beliefs have to be supported, but as possible partial explanation for a mechanism which contribute for they to develop, exist and spread.

Interesting finding is that the majority of the students-participants who were identified as conspiracy-believers in our study, believed that the virus actually existed, but that it was artificially produced in some laboratory, and/or was intentionally released in order to serve some conspiracy goals. This finding could further lead to investigate whether believing that the virus is

man-made – in comparison to the believing that it doesn't exist – is followed by a belief that it is controllable and less dangerous, which is a far less fearful outcome when compared to the belief that it naturally evolved. The perception of level of dangerousness may play important role in further behaviour related to the protective measures enacted by the authorities. Believing in conspiracy explanations may easily lead to lesser respect for measures and statements issued by health authorities based on science. Bierwiaczonek et al. (2020) point out that people who reported more COVID-19 conspiracy beliefs report less social distancing. Similarly, Allington et al. (2020) presented findings that conspiracy beliefs during and related to COVID-19 pandemic inhibit health-protective behaviours, with the strongest negative effects being associated with beliefs that imply that the coronavirus may not exist, that its lethality has been exaggerated, or that its symptoms may have a non-viral cause. Anxiety during crises increases conspiracy thinking (Grzesiak-Feldman, 2013), and conspiracy theories, in turn, motivate people to prepare for collective self-defence against suspected subjects or groups (Kofta & Sędek, 2005). For example, Bird and Bogart (2005) found that people who tend to hold HIV/AIDS conspiracy beliefs are more sceptical about HIV prevention measures. Such self-defensive behaviour and energy, especially when personal liberties are constrained and frustrated, may be directed toward health authorities and develop into a form of resistance against the protective measures, and, as Jolley and Paterson (2020) show, conspiracy beliefs could even increase violent behaviour toward objects or institutions perceived to be related to the virus or pandemic.

Limitations

These findings should be considered as initial steps towards a deeper examination of the factors that protect the psychological well-being of youth in the context of isolation due to epidemics. The fact that the sample was convenient, composed predominately of females, and had a relatively low response rate, limits the generalizability of findings. Another limitation is that we haven't baseline data in order to compare respondents' measures. It is also noteworthy that the sample was rather homogeneous, in a sense that participants' responses provided small variability – what severely limited the possibilities for data analysis.

Conclusions and Practical Implementations

Students during the time of self-isolation due to pandemic, maintained relatively high levels of well-being. Perceived social support and self-engagement in physical exercises during self-isolation, and perception of being adequately informed about the virus and the ways of protection significantly contribute to psychological well-being. Important finding is that believing in conspiracy

explanations about the SARS-CoV-2 virus and pandemic also functioned to protect well-being, this despite the fact that such beliefs falsifies reality and, in the long run, harm's one's constructive interaction with their environment. A further important and negative consequence is that believing in conspiracies can undermine protective public policies and confidence in the health authorities. Policy creators could use study findings to improve and customise their strategies and measures in order to support psychological well-being during the pandemic which seems to last long. For instance, people will be exhausted due to complying with the measures and quarantining, and consequently their adherence to the measures will most likely decline, mainly because of the frustration of their social needs (Armitage & Nellums, 2020). All relevant authorities should develop effective strategic measures to provide meaningful tools for people to receive adequate social support, and to meaningfully and more effectively communicate information about the SARS-CoV-2 virus and protective governmental measures. A strategy for thorough screening of satisfaction of these needs among population should be developed. At a level of students, universities need to engage with students' organizations in order to accomplish these goals. Professional associations need to be involved in prevention of threats to well-being and in providing psychological assistance when and where it is needed.

When analysing the responses of students, we should consider some important factors: firstly, the percentage of youth who were infected with SARS-CoV-2 was far lower than the percentage of adults, which creates in them a false sense of safety and resilience to the SARS-CoV-2 virus. Additionally, youth maybe do not share the same concerns with adults about how lock-down measures threaten their businesses or jobs. These factors may lead young people to behave less responsibly and to lack respect for the measures imposed to prevent the spread of the pandemic; in so doing they will contribute to the transmission of the virus.

In the era of flood of information, public authorities, together with the scientific community, should work on well-advised strategies for the prevention of, and fight with, fake news and conspiracy theories. Bierwiaczonek et al. (2020) showed that people who reported more COVID-19 conspiracy beliefs report less social distancing, and they point out that conspiracy theories pose a significant threat to public health as they may reduce adherence to social distancing measures. Policy creators should place special attention on communication of information tailored to youth about the virus itself and its background. This is because what brings safety and reduces anxiety in people is most probably the logical and acceptable answer, and not conspiracy plot itself. Van Prooijen (2017) emphasized the importance of education in prevention of the negative consequences of conspiracy beliefs, while Swami et al. (2014) pointed out that analytical thinking reduces believing in conspiracy theories. In the long term, we need measures for the improvement of analytical and critical thinking in students at all levels, which will empower them to deconstruct

conspiracy explanations. This will consequently create a better understanding of science-based information and thus increase confidence levels in the health system.

Important lesson from the pandemic is that it will raise the importance of online psychological support. The pandemic will probably be a turning point in regard to the wider acceptance and implementation of online methods for psychological support, and the profession should be ready for this challenge.

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PSIHOLOŠKO BLAGOSTANJE KOD STUDENATA U SAMOIZOLACIJI TOKOM PANDEMIJE COVID-19

Pandemija COVID-19 rezultirala je merama zaključavanja koje je izrekla vlada Severne Makedonije, poznato je da uslovi samoizolacije imaju direktne efekte na mentalno zdravlje. Cilj ovog istraživanja bio je usmeren na ispitivanje potencijalnih zaštitne faktore psihološkog blagostanja kod studenata u samoizolaciji. Ukupno 510 studenata sa najvećeg univerziteta u zemlji (70% ženskog pola, $M_{starost}$ = 21.12 godina, *SD* = 1.58) odgovorilo je na strukturirani onlajn upitnik, mesec dana nakon zaključavanja zemlje. Analiza višestruke linearne regresije izvršena je na pretpostavljenim zaštitnim faktorima blagostanja. Rezultati su pokazali da su značajni prediktori psihološkog blagostanja u uslovima izolacije: percipirana socijalna podrška tokom samoizolacije, samostalno bavljenje fizičkim aktivnostima, percepcija adekvatne informisanosti o virusu i načinima zaštite, kao i tendencija ka zastupanju teorija zavere o virusu i pandemiji. Percepcija medicinskih mera preporučenih od strane vlade, te ograničenje kretanja, zajedno sa aktivnostima čitanja/gledanja filmova, nisu bili značajni prediktori. Suočeni sa očekivanim daljim poteškoćama sa pandemijom, kreatori politike i naučna zajednica treba da razviju dobro osmišljene strategije, prilagođene različitim grupama, kako bi pružili odgovarajuću podršku ljudima da se izbore sa pandemijom i da na adekvatan način razumeju potrebne medicinske mere, restrikcije i sve važne informacije o virusu i pandemiji, u cilju smanjenja efekata teorija zavere koje bi mogle da podrivaju poverenje u zdravstveni sistem.

Ključne reči: COVID-19, psihološko balgostanje, samoizolacija, teorije zavere, zaštitni faktori

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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.

Keywords: COVID-19, coping mechanisms, precautionary measures, stress perception

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 operacionalized 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). 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 ± 2 (Finney & DiStefano, 2006).

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

	Min	*Max*	*M*	*SD*	*Sk*	*Ku*
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* (α = .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* (α = .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; α = .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* (α = .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; α = .67). The last two factors consisted of only two items. *Psychoactive Substance Abuse* (α = .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* (α = .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 (α = .78)	Avoidant Coping (α = .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		β	*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; ΔF – change of F-value in the second step; β – 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 (β = .34; $p < .01$) effect on approach coping and reframing, as well as a significant ($F = 39.76$; $R^2 = .06$; $p < .01$), and positive (β = .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 unpleseant 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 asses 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 Expiri-enced), 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 anlize 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

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DIRECT AND INDIRECT EFFECT OF INTOLERANCE OF UNCERTAINTY ON DISTRESS DURING THE COVID-19 PANDEMIC

Since the coronavirus outbreak influenced the whole population in 2020, many individuals, both directly and indirectly affected, experienced increased levels of distress at that time. Such a global mental health crisis requires identification of key mechanisms which contribute to distress during pandemic. Specificity of COVID-19 outbreak was lack of sufficient information at the beginning and, consequently, a high level of perceived uncertainty. The main aim of this study was to examine the influence of the intolerance of uncertainty to the experienced level of distress during the pandemic. Additionally, influence of media exposure and fear were examined. Total of 740 participants took part in an online study during the coronavirus outbreak in Serbia. Moderately high level of distress was recorded in our sample. About ⅓ of participants were in each group: no distress, moderately high and highly elevated. Results of serial mediation analysis showed that the intolerance of uncertainty had a significant direct effect on distress, but also indirect via fear of COVID-19 and media exposure. Higher levels of intolerance of uncertainty lead to more time spent on media looking for information, and consequently to higher fear and distress levels. Furthermore, it was shown that media exposure also increased the level of fear. Such results emphasized the importance of unambiguous, clear informing during the time of crisis which can decrease uncertainty, and provided some practical implication for media and authorities.

Key words: COVID-19, distress, fear, intolerance of uncertainty, media exposure

Introduction

Outbreak of COVID-19 suddenly affected not just public health, but also all aspects of humans' lives across the globe. Despite the fact that the World Health Organization had declared a novel coronavirus outbreak on 30th of January (WHO, 2020), more than a month before the first COVID-19 case in Serbia, on March 6th, it seems that the entire health system and relevant governmental institutions were not properly prepared, so it had huge influence on strategy of dealing with pandemic. From initial neglect and government underestimating of threat, to complete lockdown, closed borders, and the introduction of mandatory quarantine – that would be the short description of the situation in Serbia during the first few weeks of pandemics.

Dealing with unknown virus, potential health issues and death, altogether with losing some basic human rights (e.g., freedom of movement) and disrupted social functioning (as a result of social distancing) undoubtedly increased the psychological burden and level of stress. Moreover, getting ambiguous, often mutually conflicted recommendations from authorities certainly could affect mental health and wellbeing. While there was a limited set of recommended actions and practices that someone could take in order to protect its own self and other people (even the effects of these measures were not quite known and not definitely proven) living in the time of pandemic requires dealing with uncertainty on a daily basis. Previous studies emphasized the importance of intolerance of uncertainty for anxiety and depressive disorders. We wanted to examine whether someone's intolerance of uncertainty could be the factor which influences functioning and the experienced level of distress during a pandemic. Additionally, we also wanted to examine the mutual relations between intolerance of uncertainty, media exposure, fear and level of experienced distress.

Intolerance of Uncertainty

Intolerance of uncertainty could be broadly defined as a cognitive bias that affects the way someone processes uncertain situations on emotional, cognitive and behavioral levels. High intolerance of uncertainty results in the perception of uncertain situations as stressful, negative, and those which should be avoided. In some cases, it could result in inability to react in uncertain situations. People with a higher intolerance of uncertainty tend to interpret ambiguous information as threatening (Dugas et al., 2005). Intolerance of uncertainty was often associated with various anxiety disorders or depression (Boswell et al., 2013; Carleton et al., 2012).

Intolerance of uncertainty is already described as an important predictor in the research of the pandemics. Study (Taha et al., 2014) that investigated psychological effects of H1N1 pandemics showed that intolerance of

uncertainty predicted higher levels of H1N1-related anxiety. Participants with greater intolerance to uncertainty had a lower appraisal of their own and other control, they were using more emotion-focused coping strategies, and more often they perceived pandemic as threatening. A similar pattern was obtained in a recent study (Satici et al., 2020) that investigated the effects of uncertainty in the current COVID-19 pandemic. It was shown that greater intolerance of uncertainty could provoke fear through rumination, which could negatively affect wellbeing. Intolerance of uncertainty during COVID-19 pandemic was also associated with insomnia (Voitsidis et al, 2020). It has a mediating role between fear of COVID-19 and positivity, but also has direct effects on depression, anxiety and stress (Bakioğlu et al., 2020). Positive relations between intolerance of uncertainty and depression, anxiety and stress were also shown in a study conducted in Brazil (Ferreira et al., 2020).

Knowing that the intolerance of uncertainty is relatively stable during lifespan, it is important to measure its effects on mental health during crisis situations. That could help practitioners to identify vulnerable groups and to provide them tailored programs or interventions. Identifying the role of intolerance of uncertainty on the level of experienced stress during a pandemic also could provide useful instruction for media and governmental institutions for proper informing and providing relevant information. At the time when our research was conducted, there were not many studies that investigated the effects of intolerance of uncertainty on mental health during pandemic. It was known that higher intolerance of uncertainty is associated with higher levels of anxiety (Taha et al., 2014). In order to get further insight, we also wanted to examine the relation of IUS, media exposure, fear and distress. We assumed that intolerance of uncertainty has not only a direct contribution to experienced levels of stress, but also influences someone's media behavior and experienced fear (which could also affect the level of distress).

Media Exposure and Level of Distress

It is not surprising that communication of relevant information during crisis time could affect perceived threat and experienced anxiety (e.g., Balaratnasingam & Janca, 2006). Getting practical and realistic information from governmental organizations could diminish treat and related anxiety. In addition, a study (Jungmann & Witthöft, 2020) that investigated COVID-19 related anxiety showed negative correlation between virus-related anxiety and subjective estimation of being informed about pandemic important issues (e.g., transmission, protective measures, etc.). Media also could contribute to specific, maladaptive behavior as panic buying. This is particularly the case with ambiguous, fear-inducing media reports (Garfin et al., 2020). Finally, some researchers (Trnka & Lorencova, 2020) emphasized that the communication used by mass media (anxious emotional tone, presenting stories with negative outcomes) nega-

tively affected mental health by increasing fear, distress and traumatic feeling during COVID-19 pandemic.

Not just type of content, but also exposure to media could determine the level of acute stress. In a study (Holman et al., 2014) that investigated the effects on media after the Boston Marathon bombing, it was shown that people who reported higher exposure to bombing-related media content experienced higher levels of acute stress compared with people who actually witnessed a bombing attack.

While traditional media (TV, radio, newspapers) still have stricter control over accuracy of presented content, that is not always the case with social media. In fact, some studies showed that false information that circulated over social media lead to misconception about COVID-19, or even death of almost 200 and poisoning of 1000 people as result of false belief that alcohol could cure COVID-19 (for details see Lin et al., 2020).

During the pandemic in Serbia, the media were extensively reporting about COVID-19 situation. However, many of these contents were not objective, in fact, they could be considered unreliable, sensationalistic and panic-inducing. Moreover, there was common practice that important changes (e.g., introducing more restrictive measures, possibility of complete lockdown) were dramatically announced, and people needed to regularly check the media in order to be informed about new rules and restrictions - otherwise they could be punished for breaking the rules. Knowing all of that, we wanted to examine whether media exposure was related to increased levels of experienced distress.

Fear and Experienced Level of Distress

Perceived severity of a threatening event, the probability of its occurrence, as well as our ability to prevent it, could greatly affect the level of experienced stress and someone's behavior. A study conducted in Hungary (Gabor et al., 2020) showed that COVID-19-related fears (about illness, death, financial issues, etc.) are associated with higher levels of stress. Also, children whose parents reported fears were under higher stress compared to children whose parents did not mention fears.

Knowing that intolerance of uncertainty led to interpreting ambiguous situations as threatening, it is expected that IUS could contribute to higher fear. In fact, Satici et al. (2020) confirmed association between IUS and corona-related fear.

Finally, it is reasonable to assume that the media could also have an important role in managing fear. Depending on the type of available information, as well as duration of exposure, someone's fear could be diminished or even increased. Mertens and colleagues (Mertens et al., 2020) reported the association between media exposure and increased level of distress, while Trnka and

Lorencova (2020) showed that type of content could contribute to traumatization. Furthermore, problematic social media use was associated with fear of COVID-19 and with COVID-19 misconceptions as well as distress and insomnia, both directly, and indirectly via increased fear and COVID-19 misunderstanding (Lin et al., 2020).

There is no doubt that fear has an important purpose, and it could be a good motivator for certain protective behavior, but overwhelming fear will negatively affect functioning, mental health and behavior. Therefore, better understanding of all factors that are associated with fear is required.

The aim of the present study was to define the relationship between intolerance of uncertainty, fear of COVID-19, media exposure and perceived distress at the time of COVID-19 pandemic. In order to do so, we examined the contribution of intolerance of uncertainty, media exposure and fear in increase of distress.

Method

Sample and Procedure

Study included 740 participants from the territory of The Republic of Serbia (Subotica 51.9%, Novi Sad 15.7%, Beograd 5.1%, Sombor 4.3%, Šabac 3.2%, Bačka Topola 2.3%, Other – 10.3%) Age of the participants was between 18 and 71 years (M = 34.64, SD =12.42), and most of them were employed (531, 71.8%). There were 537 female and 203 male participants in the sample.

Research was conducted during the coronavirus outbreak in Serbia (from April 5th to 16th 2020). It started about one month after the first COVID-19 case was confirmed and 20 days after the state of the emergency was declared. At that time, strict preventive measures were introduced and promoted in Serbia (i.e., social distancing, washing hands, wearing masks in lesser extent, and police hour during evening for the general population and during the whole day for the elderly).

A questionnaire was web-based and distributed online among the general population. It was promoted on the social media groups and pages, and also individually with the help of students from the College for Vocational Studies of Preschool Teachers and Coaches in Subotica. All participants gave consent, online by clicking on agreement prior to entering the procedure.

Instruments and Measures

Four-Dimensional Symptom Questionnaire (4DSQ)

Four-Dimensional Symptom Questionnaire (Terluin et al., 2004; Serbian adaptation Kalaj et al., 2011) measure stress and related symptoms in the working population. Only *Distress* scale, consisting of 16 items, was used in this research. 4DSQ was used based on the assumption that most of our participants will be from the working population (this research is part of a bigger study that aimed to investigate the relation of current employment situation and distress during pandemic). Since a number of unemployed participants also took part in the open online study, we decided to test described effects on the general population. A 5-point likert scale (from *never* to *always*) was used for answers. Original scoring was applied, changing the 5-point scale to 3-point (0 points stands for "*never*", 1 point for "*sometimes*", and 2 points for "*regularly*", "*often*" or "*very often or constantly*"). Distress score was represented as the sum of all answers, ranging from 0 to 32. Original scoring was applied, so scores range 0-10 represent low stress, 11-20 refers to moderately elevated stress, and 20-31 strongly elevated stress category. Reliability of distress scale was high ($\alpha = .93$).

Intolerance of Uncertainty Scale (IUS)

IUS (Freeston et al., 1994; Serbian adaptation Sokić et al., 2012) measures a person's tendency to react negatively in uncertain situations. It is built by two main dimensions. The Prospective anxiety dimension refers to Cognitive and emotive aspects of intolerance, while Inhibitory anxiety influences everyday functioning. Originally, the scale consisted of 27 items, but Serbian adaptation and validation (Mihić et al., 2014) showed good metric characteristics of short 11-items solution (6 for Prospective and 5 for Inhibitory anxiety). Participants needed to answer whether some situation is characteristic for them (1 - *not at all*, to 5 - *entirely*). Since both subscales behaved similarly in our study and were highly correlated ($r = .74$), only the total IUS score was used. Reliability of 11-items scale on our sample was high ($\alpha = .93$).

Fear of COVID-19

At the time this research was conducted, no instrument measuring fear of COVID-19 was available. We constructed an instrument based on Protection motivation theory (Rodger, 1993; cited in Maddux & Rodger, 1993) previously used in research of behavior and emotions related to health crises (Milne et al., 2002). The instrument consisted of 19 items measuring 7 different subscales, but only Fear of COVID-19 scale was used in this analysis. It consisted of three

items measuring anxiety, worry and scare of coronavirus infection (items "*The thought of developing COVID-19 makes me feel anxious / worried / scared*"). Scale showed high reliability on our sample (α = .94).

Media Exposure

Measure od media exposure refers to estimated mean time that someone spends following corona-related media content („*On average, how much time during the day you spend informing yourself about coronavirus*?"). Additionally, participants were asked to estimate specific amount of time they spent informing, or following news, about coronavirus on: TV or radio, reading articles on the internet or in newspapers, on social media, and also in conversation about the coronavirus with other people (formulated as: "*In conversation with others regarding coronavirus and undertaken measures*").

Results

Results of descriptive analysis (presented in Table 1) showed significant levels of distress in our sample. Mean Distress score was moderately high (*M* = 16.31, *SD* = 9.97). One third of the cases (*N* = 250, 33.8%) were classified in low distress category, 218 participants (29.5%) in moderately elevated distress category, and 282 participants (36.8%) were in strongly elevated distress category.

It is interesting to note that the most frequent individually obtained score was 32 - the highest possible score (*N* = 55, 7.4%). Despite that, curve estimation analysis showed that linear and nonlinear models perform equally well on our data.

Fear of COVID-19 was medium on our sample (2.84 out of 5). Compared to measures obtained on Serbian population (*M* = 19.11, *SD* = 6.34, Sokić et al., 2012), Intolerance of uncertainty was 9.11 higher on average in our study, indicating higher intolerance of uncertainty during the pandemic than in regular conditions. Mean media exposure in our sample was 1 hour and 42 minutes on the average.

Table 1
Descriptive statistics of all variables used in research

Scale	*N*	*Min*	*Max*	*M*	*SD*	*Sk*	*Ku*
Age	740	18	71	34.64	12.42	0.51	- 0.67
DSQ – Distress	740	0	32	16.31	9.87	0.05	- 1.23
IUS – Intolerance of uncertainty	740	11	55	28.21	10.81	0.45	- 0.44
Fear of COVID-19	740	1	5	2.84	1.29	0.07	-1.08
Media exposure	740	0	11	1.70	1.99	2.02	5.60

Note. N – number of participants; *Min/Max* – minimal and maximal score; *M* – mean; *SD* – standard deviation; *Sk* – skewness; *Ku* – kurtosis.

Prior to main analysis, we examined correlation coefficients between all variables. Results are presented in Table 2. The highest correlation was between Distress and Intolerance of uncertainty, indicating moderately strong direct relationship. Medium correlation was obtained between Distress and Fear of COVID-19, and low correlation between Distress and Media exposure. Interestingly, correlations between Intolerance of uncertainty and Fear of COVID-19, Intolerance of uncertainty and Media exposure, and also between Media exposure and Fear of COVID-19 were significant.

Table 2
Intercorrelations of all variables used in research

Variable	1	2	3	4
1. Distress	-	.58**	.36**	.22**
2. IUS – Intolerance of uncertainty		-	.42**	.22**
3. Fear of COVID-19			-	.18**
4. Media exposure				-

Note. ** $p < .01$.

Serial mediation analysis was performed using PROCESS macro in SPSS (Model 6, Hayes, 2018) to test direct and indirect influence of Intolerance of uncertainty on the Distress. Gender and Age was used as covariate in the model. Results of mediation analysis are presented on Figure 1.

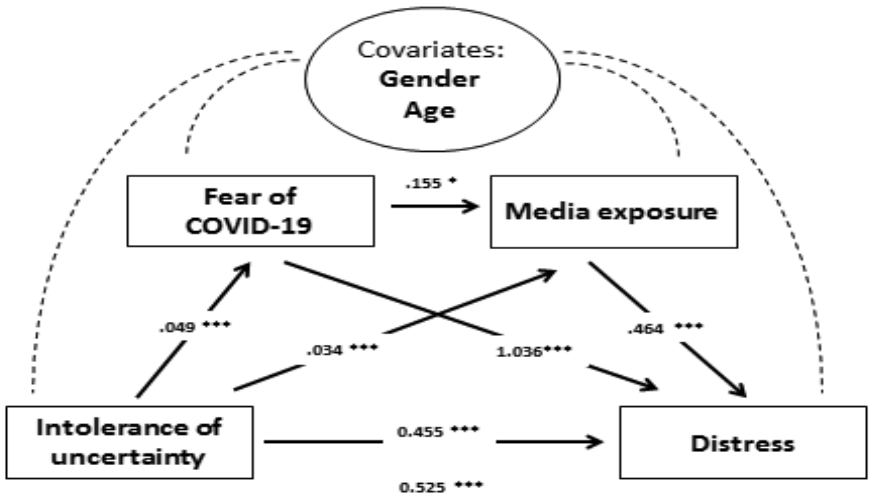

Figure 1. The result of serial multiple mediation model. Values shown are unstandardized coefficients. * $p < .05$, *** $p < .001$.

We found a strong direct effect of Intolerance of uncertainty on Distress ($B = 0.45$, $p < .001$). More one cannot tolerate uncertainty – distress gets higher. When mediators were included, Intolerance of uncertainty had a stronger total effect ($B = 0.53$, $p < .001$). Indirect effect of Intolerance of uncertainty on Distress was significant both via *Fear of COVID-19* ($B = 0.05$, *95% CI* [0.02, 0.08]) and Media exposure ($B = 0.02$, *95% CI* [0.01, 0.03]). If one cannot tolerate uncertainty, it is more exposed to media, and media exposure leads to higher distress levels. Similarly, greater intolerance leads to greater levels of experienced fear, and fear leads to elevated distress.

It is interesting to note there was also significant relationship between Media exposure and Fear of COVID-19 ($B = 0.16$, $p< .001$), and compound effect of IUS – Fear – Media exposure – Distress was significant ($B = 0.004$, *95% CI* [0.000, 0.008]). In this case, intolerance leads to greater levels of fear, which leads to greater media exposure, and both together leads to higher levels of distress.

It seems that the media have an important role in increasing distress, both directly and as mediators. It is important to consider time spent on particular media following news about coronavirus (all presented in Table 3). Participants most often watched TV (50.4 minutes) and read articles in newspapers or on the internet (42 minutes). Interestingly, participants reported to spend about 41 minutes of every day in conversation about coronavirus with other persons. Similar time was obtained for social media informing (39.6 minutes). The last frequent way of informing is listening to the radio (13.8 minutes).

Table 3
Descriptive statistics of exposure to particular media type

Scale	*N*	*Min*	*Max*	*M*	*SD*	*Sk*	*Ku*
Media exposure - overall	740	0	11	1.70	1.99	2.02	5.60
TV	740	0	11	0.84	1.49	3.75	20.05
Newspaper or online articles	740	0	11	0.70	1.51	3.96	20.08
Conversation about coronavirus	740	0	11	0.69	1.43	4.39	25.58
Social media	740	0	11	0.66	1.48	4.20	22.37
Radio	740	0	11	0.23	0.91	6.83	62.04

Note. N – number of participants; *Min/Max* – minimal and maximal score; *M* – mean; *SD* – standard deviation; *Sk* – skewness; *Ku* – kurtosis.

Contribution of particular media exposure on distress was tested using linear regression. Obtained model was significant ($R^2 = 0.07$, $F(5, 734) = 10.88$, $p < .001$), which indicates that total corona-related media consumption was associated with higher distress. However, only conversation about coronavirus turned out to be a significant single predictor ($\beta = 0.14$, $t = 3.20$, $p < .01$). Exposure to other particular media was not significant in explaining distress.

Discussion

This study confirmed a moderately high level of distress in the general population in The Republic of Serbia during the coronavirus outbreak. Two third of participants reported moderately or strongly elevated distress. Furthermore, 7.4% of them reported the highest possible score on distress scale. Similarly, we observed increased levels of intolerance of uncertainty. These results are not surprising considering the fact at that time coronavirus were novel, transmission was partially explained and possible negative outcomes were overestimated.

Our results confirmed the strong direct effect of intolerance of uncertainty on distress: increased levels of intolerance of uncertainty were associated with higher levels of distress. This result is in accordance with the results of the previous studies (Bakioğlu et al., 2020; Ferreira et al., 2020).

The most significant contribution of our study is identifying strong indirect effects of intolerance of uncertainty on distress via fear of infection and media consumption. Only complex interrelation of these four factors could lead to a satisfying explanation of the dynamics of increasing distress process during the time of crisis.

Fear of COVID-19 infection could directly increase the level of distress. It was also related to intolerance of uncertainty: higher levels of intolerance of uncertainty were associated with increased fear. These results are not sur-

prising and they are comparable with the results of the previous studies (e.g., Gabor et al., 2020; Satici et al., 2020).

Considering media exposure, we found that the amount of time someone will spend consuming media corona-related content could be influenced by intolerance of uncertainty: a person who cannot deal with uncertainty will spend more time searching for information that could provide further insight and concrete recommendations. Furthermore, higher media exposure actually leads to distress. As Holman and colleagues previously stated, media exposure could increase the level of acute stress and that results were also replicated in our study (Holman et al., 2014).

In addition, we wanted to identify whether the type of media had a different effect on the experienced level of distress. Although the higher exposure to all media was associated with higher levels of distress (same results were obtained in Trnka and Lorencova, 2020, but also in Holman et al., 2014), the only statistically significant relation was found between the amount of time that one spent in talking about coronavirus and level of distress. This could be a sign of worry for the beloved ones, but also could be due to distrust in the media. It could serve as a coping strategy for dealing with uncertainty: someone who does not trust the media needs another source of information and reassurance - and that is a trustworthy, familiar person.

Confirming the relation between intolerance of uncertainty and higher distress has both theoretical and practical implication. Maybe the most effective way of dealing with distress during a pandemic could be reducing observed uncertainty of the situation by a different approach to reporting. Changing style of informing, making information comprehensive and undoubtful, based on evidence, could lead to less uncertainty level, and consequently to lower level of distress in the general population. It could also help in avoiding mass panic and irrational behaviors. With clear information about virus transmission, it is possible to decrease the level of experienced fear and distress, and to promote self-protective practices.

Additionally, obtained results could serve as a starting point for improving practitioners' guidelines. Knowing that people with higher intolerance of uncertainty tend to spend more time on media, practitioners could make recommendations on how to stay informed without increasing fear and distress. Finally, understanding the role of intolerance of uncertainty could help us in identifying vulnerable groups that might need additional support during the time of crisis.

It is important to emphasize that our study does not have causal character, so alternative explanations could be considered, at the end. For example, it is possible that increased distress also has a reverse effect on time spent on informing: the more somebody is distressed, he could be looking for additional information. It could be true also for intolerance of uncertainty and fear. Exact nature of these interrelationships should be examined in some future studies.

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DIREKTNI I INDIREKTNI EFEKTI NETOLERANCIJE NA NEIZVESNOST NA DISTRES TOKOM COVID-19 PANDEMIJE

Pandemija izazvana koronavirusom uticala je na celokupnu populaciju, izazivajući kod mnogih pojedinaca, indirektno ili direktno pogođenih, povišeni nivo distresa. Takva globalna kriza mentalnog zdravlja zahteva identifikaciju ključnih mehanizama koji dovode do povećanog distresa tokom pandemije. Specifičnost početka COVID-19 pandemije ogledala se u nedostatku informacija i, posledično, u visokom nivou procenjene neizvesnosti. Glavni cilj ovog istraživanja bio je ispitivanje efekta netolerancije na neizvesnost na doživljeni nivo distresa tokom pandemije. Dodatno, ispitivan je i posredni efekat medijske izloženosti, kao i straha u vezi sa COVID-19 infekcijom. Ukupno 740 ispitanika učestvovalo je u online istraživanju na početku pandemije u Republici Srbiji. U našem uzorku izmeren je umereno visok nivo distresa. Približno ⅓ ispitanika bila je u svakoj grupi: bez distresa, umereno visok i veoma povišen nivo distresa. Rezultati analize serijalne medijacije pokazali su da netolerancija na neizvesnost ima značajan direktan efekat na distres, ali i indirektan, preko straha od COVID-19 infekcije i preko medijske izloženosti. Viši nivo netolerancije na neizvesnost povezan je sa većom količinom vremena provedenom u traženju informacija u medijima i, nadalje, sa višim strahom i višim nivoom distresa. Pokazano je, takođe, da je medijska izloženost povezana sa povećanim nivoom straha od virusa. Ovakvi rezultati ukazuju na važnost nedvosmislenog i jasnog informisanja tokom krize, koje ima potencijal da smanji neizvesnost, i pružaju praktične implikacije za medije i državne institucije.

Ključne reči: COVID-19, distress, medijska izloženost, netolerancija na neizvesnost, strah

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"MY PRECIOUS… TOILET PAPER": STOCKPILING DURING THE COVID-19 PANDEMIC IS RELATED TO SELFISHNESS, BUT NOT TO FEAR

Stockpiling during a crisis is usually seen as a response to experienced fear or as a form of social behavior. This study aimed to explore the effects of personality traits linked to antisociality (selfishness) and prosociality (prosocial tendencies) and the context-related state factor (fear related to the pandemic) on stockpiling during the COVID-19 pandemic. The final sample included 545 participants (77.6% females) from Serbia. During the proclaimed emergency state and curfew in March and April 2020, data were collected on three aspects of selfishness (adaptive, egocentric, and pathological), six types of prosocial tendencies (altruism, dire, compliant, emotional, public, and anonymous), and the state of fear related to the pandemic. First, the results showed that gender, age, and educational level were not related to stockpiling, while household size positively correlated with stockpiling. Second, the results showed that adaptive and pathological selfishness as well as the public prosocial tendency showed low positive correlations with stockpiling, while altruism showed a low negative correlation. The obtained correlations held even when household size was controlled for. However, in the regression analysis, only adaptive selfishness showed a small but significant effect on stockpiling, over and above household size. In sum, the results showed that fear related to the pandemic was not associated with stockpiling, indicating that stockpiling could be seen as a form of selfish behavior.

Keywords: stockpiling, selfishness, prosocial tendencies, fear, the COVID-19 pandemic

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Introduction

The novel coronavirus was first identified in the Chinese province of Hubei in December 2019. In January 2020, the World Health Organization declared an outbreak. On March 11, it declared the pandemic of COVID-19 – a disease caused by this virus. The first official case of a COVID-19 infection in Serbia was registered on March 6. The Serbian Government declared a state of emergency only 9 days later, on March 15. Restriction of movement was enforced for all citizens. At first, it was in effect every day from 8 p.m. until 5 a.m. the following morning. Later, this measure was gradually tightened to reach movement restriction from 5 p.m. until 5 a.m. on workdays as well as throughout the whole weekend. The emergency state ended on May 6, while other recommended protective measures remained. The emergence of a new, highly infectious virus is a stressful situation in itself and introducing a state of emergency in the country only raises general concern and anxiety over the situation (Salari et al., 2020).

One of the specific behaviors during global crises such as a pandemic is stockpiling goods. Following the outbreak of the novel coronavirus in early March, many people started to store larger quantities of food and medical supplies (Knotek II et al., 2020) as well as cleaning and hygiene products. Each country registered stockpiling among citizens (e.g., 61% among participants from Denmark and the United Kingdom, see Dammeyer, 2020). Although there is no official record of the Statistical Office of the Republic of Serbia, Serbian news reported a 91-482% increase in the sales of specific items during March 2020 (Bankar, 2020, April 4th). This kind of behavior has been observed during other global crises, such as hurricane seasons and volcanic eruptions. For example, in one qualitative study, it was shown that shoppers who engaged in panic buying during hurricanes did not exhibit this behavior before the hurricane season (Kulemeka, 2010).

Stockpiling is procuring real or perceived emergency supplies and it refers to the "phenomenon of a sudden increase in buying of one or more essential goods in excess of regular need provoked by adversity, usually a disaster or an outbreak resulting in an imbalance between supply and demand" (Arafat et al., 2020a, pp. 100). Stockpiling stems from an individual's response, either rational or emotional (when it usually refers to panic buying), to perceived or predicted scarcity (Micalizzi et al., 2020). Scarcity may cause stress, anxiety, fear or panic, leading people to stock more goods than they need (Sterman & Dogan, 2015). According to literature, stockpiling could be seen as a behavioral strategy of regulation of distress and fear (e.g., Rajkumar, 2020) or as an outlet for regaining control over the situation, both caused by the uncertainty of the situation (e.g., Arafat et al., 2020b; Yuen et al., 2020). Thus, fear motivates individuals to make purchases because they could offer them a sense of security, comfort, momentary escape, and reduced stress. Such behavior is often not

motivated by the actual need for the goods, but rather by the need for the regulation of negative emotions (see Yuen et al., 2020).

Indeed, previous research has shown that worry about COVID-19 is positively related to stockpiling (Micalizzi et al., 2020). In the study that Cyprzanska and Neylek (2020) carried out in Poland, stockpiling was not assessed on its own, but in combination with other behaviors characterized as self-preservation. In this study, self-preservation behaviors were related to the panic about the novel coronavirus and higher self-preservation was observed after the first fatality in Poland was announced. Furthermore, the panic mediated the relationship between the perceived threat to self and self-preservation behaviors. Brizi and Biraglia (2020) showed that the need for cognitive closure, which is related to the intolerance of uncertainty, anxiety, and risk avoidance, is positively related to both stockpiling and food waste. These authors concluded that individuals with a high need for cognitive closure more often choose the individualistic strategy of buying more food, even if this leads to less food for others and more food waste.

This brings us to another characteristic of stockpiling. As a social behavior, stockpiling could be harmful to others, leaving fewer supplies for those who may need them. In this vein, stockpiling could be seen as a socially undesirable behavior (see Yuen et al., 2020) or as a lack of prosocial behavior (Columbus, 2020). One of the basic personality traits that are commonly linked to prosocial tendencies is Honesty-Humility from the HEXACO model (Ashton & Lee, 2007). A previous study showed that Honesty-Humility was negatively related to extra shopping in the period from March 13 to March 17 2020, although the correlation was low (Columbus, 2020). Honesty-Humility could be seen as the core of the constellation of socially aversive traits, i.e., Dark Triad traits (Machiavellianism, narcissism, and psychopathy, see Hodson et al., 2017). Thus, it is not surprising that Dark Triad traits were related to stockpiling behavior (the authors used the term *hoarding*) in the period between March 15 and March 29 2020 (Nowak et al., 2020). In another study, stockpiling was negatively related to social distancing during the COVID-19 pandemic, which could also be seen as a form of prosocial behavior (see Cao et al., 2020).

However, not all studies have confirmed the significant and negative link between stockpiling and traits that are related to prosociality. For example, Garbe et al. (2020) explored the stockpiling of only one item – toilet paper – in the period between March 23 and March 29 2020. Across 22 countries, they did not find that Honesty-Humility from the HEXACO model was associated with stockpiling, but they found the effects of other personality traits. People high on Conscientiousness reported shopping more frequently in the previous two weeks, as well as buying larger amounts and already stocking more toilet paper. Those low on Openness to Experience also had more stocked toilet paper in their households. Older individuals and people who felt more threatened by COVID-19 shopped more frequently, bought more packages, and had more rolls in stock, while household size was positively related to the number of

bought packages only. Emotionality predicted the perceived threat and had an indirect effect on the number of bought packages, but did not affect shopping frequency or the number of toilet rolls stocked (Garbe et al., 2020). Interestingly, Zettler et al. (2020) showed that hoarding was weakly negatively related to Honesty-Humility and Agreeableness and positively related to Openness to Experience and narcissistic rivalry, but they concluded that there was no substantive link between hoarding and personality traits across the samples they used. However, it should be noted that they followed hoarding behavior over a longer period of the pandemic, from March to May 2020.

In a study in which Big Five personality traits were linked to stockpiling, higher Extraversion and Neuroticism and lower Openness to Experience and Conscientiousness were related to stockpiling and buying extra products, but the same was not true for Agreeableness, the trait related to prosocial tendencies (Demmeyer, 2020). Demmeyer (2020) also showed that sex, age, the level of education, and the number of members in the household did not have an effect on stockpiling.

These findings suggest that when exploring the phenomenon of stockpiling, some demographic characteristics should be taken into account. For example, Hori and Iwamoto (2014) explored the effects of demographic characteristics on panic buying among citizens of Tokyo following the 2011 Tohoku earthquake. They showed that households in urban areas, households with a large number of family members, and households with a middle-aged or older full-time homemaker wife were more likely to engage in panic buying. Micalizzi et al. (2020) showed that stockpiling in the USA in the period from April 8 to April 10 2020 was more commonly observed among males (note that stocked items did not only include food and medicine but also weapons, gold, and cash), younger individuals, those with a higher educational level, and those who have more individuals in the home, while income had no significant effect. However, in the regression analysis, only the number of individuals in the house emerged as a significant predictor, along with worry about the pandemic, conservative political orientation, and keeping less social distance.

In sum, previous results have revealed that stockpiling behavior in a crisis could be explained by at least two mechanisms: fear of the pandemic (e.g., Micalizzi et al., 2020), which could be seen as a context-related state factor, and the lack of prosociality (Columbus, 2020) or the antisocial tendency (Nowak et al., 2020), which could be seen as a personality factor. This study aimed to further explore the effects of specific personality and context-related state factors on stockpiling during the COVID-19 pandemic, these being the main mechanisms underlying this kind of behavior. Previous results have shown that prosocial and antisocial tendencies are not simply the opposite poles of one dimension (e.g., Lebowitz et al., 2019), which is why it seems warranted to explore them both. Since the trait of selfishness could be seen as the core of antisocial tendencies (e.g., Diebels et al., 2018) and it is negatively related to Honesty-Humility (Raine & Uh, 2018), we explored the effect of selfishness

on stockpiling along with the effects of different types of prosocial tendencies. Fear related to the pandemic was explored as a context-related state factor. Since some demographic characteristics have proven to be important predictors of stockpiling (e.g., the number of household members, see Micalizzi et al., 2020), we included them in order to control their effects on relationships between stockpiling and both personality and context-related state factors.

Method

Participants and Procedure

The data were collected online in the period from March 28 to April 6 2020 (the 2nd and the 3rd week of the emergency state). Information about the study was spread via social networks and people were invited to participate and to forward the invitation to others. At the beginning, participants were informed about study aims and only those who gave their consent proceeded to study questions. Participation in the study was anonymous and we did not collect any identifying data.

The original sample included 581 participants. After the elimination of univariate outliers ($z > \pm 3.33$, see Tabachnick & Fidell, 2013) on items about hoarding and sum scores of the used measures, 545 participants (77.6% females) were kept. Participants were aged between 19 and 70 years ($M = 34.03$, $SD = 10.09$). Most of them were highly educated (51.6% university graduates, 10.6% university postgraduated, 21.5% students, and 5.7% finished college), while 10.6% finished primary or secondary school. Participants reported 1 (meaning they lived alone) to 11 household members. Due to the small frequencies of participants in households with more than 6 members, these answers were merged into one category. Thus, 12.8% reported that they lived alone, 26.8% that they lived with another person, 21.8% that they lived with two more household members, 25.7% that they lived with three more household members, 8.1% that they lived with four more people, and 4.8% that they lived with five more household members. The recoded variable of household size had $M = 3.04$ and $SD = 1.34$. The study was a part of a larger research project, which was approved by the Ethical Committee of the Department of Psychology, Faculty of Philosophy, University of Novi Sad, Serbia, which is the Second Instance Commission of the Ethical Committee of the Serbian Psychological Society (No. 202003221959_nytc).

Measures

Stockpiling

Stockpiling during the COVID-19 pandemic was measured via an ad-hoc constructed scale containing 9 items (e.g., toilet paper, flour, masks, and disinfectants). Participants stated how many items (in liters, kilograms or pieces, depending on how the item is sold) they bought during the previous week. In the exploratory factor analysis (principal axis method) carried out on standardized scores (in order to express each item on the same scale), only one factor had eigenvalue over 1 ($\lambda = 2.24$) and it explained 24.86% of the common variance (the eigenvalue of the second factor was 0.68). We used the factor score as a measure of stockpiling in the analyses. Cronbach's alpha on standardized scores was .71. Descriptives for each item are presented in Table 1 and factor loadings can be seen in Table A in Supplement.

Fear Related to the Pandemic

Fear related to the pandemic was measured by the Fear scale of the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988, for the Serbian adaptation see Mihić et al., 2014), which consists of 5 items ($\alpha = .89$). Participants were asked to judge on a five-point Likert scale (from 1 - *not at all* to 5 - *very much*) how they felt since the COVID-19 pandemic started in Serbia. The alpha obtained in this study was in line with previous research (Mihić et al., 2014).

Selfishness

The Selfishness Questionnaire (SQ; Raine & Uh, 2018) contains 24 items that measure three aspects of selfishness: adaptive (8 items, $\alpha = .73$), egocentric (8 items, $\alpha = .70$), and pathological selfishness (8 items, $\alpha = .76$). Adaptive selfishness describes selfish acts with benefits for oneself and close persons such as family and friends; egocentric selfishness describes a single-minded attentional focus on the self; pathological selfishness includes inflicting harm upon others for self-advancement purposes. A five-point Likert scale was used (from 1 - *strongly disagree* to 5 - *strongly agree*). Since there was no previous validation study of the Serbian adaptation of the SQ, we conducted a confirmatory factor analysis to calculate model fit. Fit indices indicated excellent model fit: DWLS$\chi^2(249) = 464.71$, $p < .001$, CFI = .97, TLI = .97, RMSEA = .04 (90% CI .03-.05), SRMR = .06. Loadings ranged from .30 to .62. The obtained alphas in this study were in line with those obtained in a previous study (.76 for egocentric, .71 for adaptive, and .75 for pathological, see Raine & Uh, 2018).

Prosocial Tendencies

The Prosocial Tendencies Measure (PTM; Carlo & Randall, 2002) contains 23 items and assesses 6 types of prosocial tendencies: altruism, defined as voluntary helping motivated primarily by one's concern for the needs and welfare of others (5 items, $\alpha = .47$), compliant prosocial behavior, defined as helping others in response to a verbal or nonverbal request (2 items, $\alpha = .78$), emotional prosocial behavior, defined as helping others under emotionally evocative circumstances (4 items, $\alpha = .77$), dire, defined as helping in crises or emergencies (3 items, $\alpha = .54$), public prosocial behavior, performed in front of an audience and at least partially motivated by the desire to gain the approval and respect of others and enhance one's self-esteem (4 items, $\alpha = .72$), and anonymous prosocial behavior, defined as helping without others being aware of who had helped them (5 items, $\alpha = .81$). Participants were asked to rate the extent to which each item described them on a five-point scale (from 1 - *does not describe me at all* to 5 - *describes me greatly*). In this research, we used the Croatian version of the PTM (Wertag et al., 2018) and adapted it to the Serbian language. In the Croatian sample, the alphas of the scales ranged from .56 (altruistic) to .84 (anonymous and emotional, see Wertag et al., 2018) and similar patterns could be seen in the alphas obtained in this study. Since there was no previous validation study of the Serbian adaptation of the PMT, we conducted a confirmatory factor analysis to calculate model fit. Fit indices indicated good model fit: DWLS$\chi^2(215) = 457.55$, $p < .001$, CFI = .95, TLI = .94, RMSEA = .05 (90% CI .04-.05), SRMR = .06. Loadings ranged from .23 to .82.

The measures used in this study were a part of a larger data set and they were given in the following order: Fear related to the pandemic, Stockpiling, the Selfishness Questionnaire, the Prosocial Tendencies Measure, and in the end, demographic variables.

Results

Descriptives for selfishness and prosocial tendencies are presented in Table B in Supplement, along with correlations between these variables. Descriptives for each stocked item in the period of one week are presented in Table 1. Quantities of each stocked product ranged from zero to one hundred (for sanitary gloves) and the maximum quantities for all products seemed to be far greater than the regular needs of an average family. Mean values were not high, indicating that the majority of people did not buy large quantities of these products. However, some participants did mention in open-ended questions that they were prevented from buying more goods, because of the short supplies or complete lack of certain products. Likewise, we did not ask if the participant was the person who usually carried out grocery shopping in their household, nor if they already had stocks of the specified products at home.

These limitations should be taken into account in the interpretation of the results.

Since skewness and kurtosis of some items were above the recommended values for normal distribution, each item was normalized (via the rankit method) and standardized. However, the correlation between the factor score on normalized standardized and standardized variables was high (r = .93, p < .001). The preliminary analysis showed no differences in the results based on these two types of scores, which is why we presented the analyses on standardized scores.

Table 1
Descriptives for each stocked item

	Min	*Max*	*M*	*SD*	*Sk*	*Ku*
Flour (in kg)	0	35	2.95	4.49	3.51	14.90
Sugar (in kg)	0	10	1.05	1.55	3.18	14.00
Oil (in liters)	0	20	1.67	1.84	4.16	29.32
Can (no. of cans)	0	25	3.74	4.10	1.85	4.81
Toilet paper (no. of rolls)	0	50	10.99	8.47	1.27	2.68
Disinfectant (no. of bottles)	0	7	1.26	1.23	1.48	2.46
Soap (no. of soaps)	0	12	2.18	1.92	1.45	3.35
Sanitary gloves (no. of pairs)	0	100	8.78	19.26	3.53	12.87
Face mask (no. of masks)	0	40	3.65	5.07	2.51	9.67

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

There was no gender difference in stockpiling (t(491) = -0.04, p = .97) and correlations with age (r = .07, p = .102) and educational level (ρ = -.03, p = .57) were not significant. However, there was a significant correlation with the number of members in the household (ρ = .25, p < .001), with those living in households with more members being more prone to stockpiling. Thus, the effect of household size should be considered in the exploration of relationships between stockpiling and personality and context-related state factors.

Correlations between stockpiling and other variables showed a positive relationship with adaptive and pathological selfishness (Table 2, for the remaining correlations see Table B in Appendix). Additionally, stockpiling was positively related to the public prosocial tendency and negatively related to the altruistic prosocial tendency (due to the lower alpha in altruism, we calculated the correlation with a correction for attenuation, r = -.17). All correlations were small in magnitude. Interestingly, there was no significant relationship between stockpiling and fear related to the pandemic. The correlations remained significant after they were partialized by the number of household members.
Table 2

Descriptives and correlations between stockpiling and other variables

	M	*SD*	Stockpiling	Stockpiling partialized by household size
Context-related state factor				
Fear related to the pandemic	2.75	0.98	.05	.07
Specific personality factors				
Adaptive selfishness	2.38	0.71	.13**	.15***
Egocentric selfishness	1.93	0.58	.05	.08
Pathological selfishness	1.68	0.59	.11**	.13**
Dire prosocial tendency	3.75	0.77	.03	.03
Public prosocial tendency	1.40	0.52	.11**	.11*
Anonymous prosocial tendency	3.31	0.94	.04	.02
Compliant prosocial tendency	4.11	0.78	-.00	-.02
Emotional prosocial tendency	3.71	0.85	.07	.05
Altruism prosocial tendency	4.33	0.52	-.10*	-.10*

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

In order to further explore the effects of personality traits and the context-related state of fear on stockpiling, a hierarchical regression analysis was conducted. Household member number was entered in the first step to control its effect and the remaining variables were entered in the second step. Since the number of predictors was rather large, the stepwise method was chosen in order to select the optimal set of predictors that results in the best performing model (Tabachnick & Fidell, 2013). The results showed that household size had a significant effect and explained 7% of the stockpiling ($F(1,491) = 35.92$, $p < .001$; $\beta = .26$, $p < .001$). Among variables added in the second step, only adaptive selfishness had a significant effect over and above household size ($\beta = .14$, $p = .001$) and explained an additional 2% of the stockpiling ($F(1,490) = 11.12$, $p = .001$).

Discussion

The main aim of this research was to explore the effects of specific personality and context-related state factors on stockpiling during the early stage of the COVID-19 pandemic. In line with previous theoretical assumptions (e.g., Arafat et al., 2020b; Yuen et al., 2020) and empirical evidence (e.g., Columbus, 2020; Micalizzi et al., 2020), we explored the two main mechanisms underlying stockpiling during crises: fear related to the pandemic as a context-related state factor and the lack of prosocial tendencies or antisocial tendencies as specific personality factors. The main result of this study was that stockpiling

was related to specific personality traits and not to the context-related state of fear. Thus, our results highlight the role of specific personality traits in stockpiling behavior. They are in line with previous studies that identified a link between stockpiling during the pandemic and antisocial and socially aversive traits (Nowak et al., 2020) or low prosocial tendencies (Columbus, 2020).

However, the results of our study are not in line with previous research that found stockpiling to be related to worry about the pandemic and the feeling of threat from COVID-19 (Garbe et al., 2020; Micalizzi et al., 2020). Our findings imply that stockpiling might result from a lack of solidarity and concern for others' needs and not from fear, anxiety, and similar emotional states.

Relations between specific personality traits and stockpiling held even after household size was controlled for. In most previous studies, household size emerged as an important correlate of the number of stocked toilet paper rolls (Garbe et al., 2020) as well as other items (Micalizzi et al., 2020), which is in line with our results. However, it should be noted that there is a study in which living agreement was not associated with buying extra amounts of products (Dammeyer, 2020). The effects of other demographic characteristics (sex, age, and educational level) were not significant. Previous studies have shown mixed results about the effects of these characteristics (e.g., Brizi & Biraglia, 2021; Dammeyer, 2020; Garbe et al., 2020; Micalizzi et al., 2020).

Furthermore, our results highlight the roles of specific selfishness dimensions and motives for prosocial behavior in stockpiling. Significant correlates of stockpiling were adaptive and pathological selfishness as well as a higher tendency towards public prosocial behavior and lower altruism. However, in the regression analysis, only adaptive selfishness emerged as a significant predictor of stockpiling over and above household size. Adaptive selfishness is a construct based on evolutionary theory. It is the least pathological form of selfishness and it refers to care not only for oneself but also for close people, i.e., family members and sometimes friends (Raine & Uh, 2018). In this vein, some selfish behaviors could be justified on the basis that close ones benefit from it, which in turn serves to promote genetic fitness. Thus, people who exhibit a tendency towards selfishly providing for oneself and their own family are more likely to stock larger quantities of goods. It could be assumed that this way, they ensure access to essential goods for close ones, which in turn ensures their own promotion of genetic fitness.

However, the other question is whether this "survival" strategy is optimal and advantageous. In our study, it was related to stockpiling over and above household size, which shows that it is not exactly optimal, because more resources (e.g., money) were spent than necessary. As stated Raine and Uh (2018), adaptive selfishness should not be seen as adaptive in absolute terms, but as more functional than other forms of selfishness. Their results showed that it was related to antisocial traits as well as other aspects of selfishness, but that it had the weakest associations with these traits among all types of selfishness.

Although pathological selfishness did not have a unique predictive contribution in the regression analysis, its significant correlation with stockpiling highlights the antisocial nature of this kind of behavior. Pathological selfishness is viewed as the most antisocial form of selfishness and it includes manipulation, exploitation of others, and reward-seeking for self-advancement (Raine & Uh, 2018). Moreover, stockpiling showed a positive correlation with the tendency towards public prosocial behavior and it correlated negatively with altruism. In previous research, the public prosocial tendency has been negatively related to altruism (Carlo & Randall, 2002) and Agreeableness, while it has not been related to volunteer work, honorary work office activities, or laboratory-induced prosocial behavior (Rodrigues et al., 2017). The public prosociality is related to self-oriented motives and it is driven by the desire to gain the approval and respect of others and enhance one's self-worth (Carlo & Randall, 2002). Thus, it does not represent a genuine concern for others' well-being. Therefore, our study showed that stockpiling is associated with little concern over welfare of others.

There are several limitations of this study. First, the sample was convenient and comprised more women than men. Second, we did not ask the participants whether they or other members of their household where in charge of buying supplies. Furthermore, some participants stressed that they did not have the opportunity to buy goods, because local stores were already out of supplies. These factors could account for the rather low correlations obtained in this study. It is possible that if these factors were controlled for, the correlations with other measured constructs would have been higher or, in some cases, statistically significant. This might explain the insignificant relationship with fear of the pandemic, which emerged as a significant determinant of stockpiling in certain studies (e.g., Micalizzi et al., 2020). Since store supplies cannot be controlled, the suggestion might be to reframe the question and ask about the planned purchase. When it comes to the issue of who buys supplies for the household, future studies could analyze only those who carry out this role. Third, the generalizability of the results is limited to the local context, since the proclaimed restriction measures differed from country to country. Fourth, we did not measure fear of the pandemic or infection itself, but rather the state of fear that emerged after the pandemic started. Thus, different relations could be expected if the measure had a more specific scope. Finally, since relations between personality traits and stockpiling were low, there is a need to include other variables in the explanation of this behavior. Although fear related to the pandemic was not correlated with stockpiling, the effects of other context-related factors could be explored in future studies, such as trust in the government and the community, the proclamation of severe protective measures, the impact of media informing about scarcity, and the communication strategies of the crisis headquarters (see Yuen et al., 2020).

Despite these limitations, this study contributes to the understanding of stockpiling as a form of social behavior and gives further evidence of relation-

ships between specific personality traits and stockpiling during global crises. Although correlations between personality traits and stockpiling were low, our results indicate that not all people react the same to the challenges of a global crisis. Our results suggest that it would be useful if media reports propagated solidarity with others and promoted responsive and restrained buying by raising empathy and encouraging perspective-taking with those who are in greater need. At the same time, media can help in establishing restrained buying by informing the citizens about the amounts of goods that are objectively needed per capita and within a specific timeframe (e.g., two weeks). Finally, in case of a prolonged crisis, governments could come out with measures that would control the amounts of bought products in accordance with household size and membership to vulnerable groups.

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Appendix

Table A
Factor loadings on the stockpiling measure (principal axis method)

Item	Loading
Flour	.49
Sugar	.67
Oil	.57
Can	.21
Toilet paper	.48
Disinfectant	.55
Soap	.57
Sanitary gloves	.23
Face mask	.40

Table B
Correlations between variables

	1	2	3	4	5	6	7	8	9	10
1 Fear related to the pandemic	1									
2 Adaptive selfishness	.10	1								
3 Egocentric selfishness	.01	.61	1							
4 Pathological selfishness	.04	.70	.56	1						
5 Dire	.01	-.02	-.16	-.05	1					
6 Public	.10	.20	.17	.27	.05	1				
7 Anonymous	.03	-.14	-.21	-.10	.19	-.06	1			
8 Compliant	.00	-.14	-.25	-.19	.42	-.06		1		
9 Emotional	.15	.10	-.03	.05	.56	.11	.16	.37	1	
10 Altruism	-.10	-.39	-.31	-.36	-.09	-.42	.05	.02	-.20	1
M	2.75	2.38	1.93	1.68	3.75	1.40	3.31	4.12	3.72	4.33
SD	0.99	0.71	0.58	0.59	0.77	0.52	0.94	0.78	0.85	0.52

Notes. M – mean; *SD* – standard deviation. Correlations ± .10 are significant at $p < .05$.

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"MY PRECIOUS… TOILET PAPER": GOMILANJE ZALIHA TOKOM COVID-19 PANDEMIJE JE POVEZANO SA SEBIČNOŠĆU, ALI NE I SA STRAHOM

Gomilanje zaliha tokom krize se obično shvata kao reakcija na doživljeni strah ili kao forma socijalnog ponašanja. Cilj ovog istraživanja je ispitivanje efekata osobina ličnosti iz domena antisocijalnih (sebičnost) i prosocijalnih tendencija i stanja specifičnog za konktest pandemije (strah u vezi s pandemijom) na gomilanje zaliha tokom COVID-19 pandemije. Istraživanje je sprovedeno tokom vanrednog stanja, po uvođenju policijskog časa, u martu i aprilu 2020. god. i finalni uzorak obuhvata 545 ispitanika (77.6% ženskog pola) iz Srbije. Prikupljeni su podaci o tri dimenzije sebičnosti (adaptivna, egocentrična i patološka), šest tipova prosocijalnih tenencija (altruizam, smelost, pomaganje na zahtev, u emocionalno zahtevnim situacijama, javno i anonimno) i stanje straha u vezi s pandemijom. U pogledu demografskih karakteristika, rezultati pokazuju da pol, starost i nivo obrazovanja nisu povezani sa gomilanjem zaliha, ali broj članova domaćinstva ostvaruje pozitivnu vezu sa gomilanjem zaliha. Potom, adaptivna i patološka sebičnost, kao i tendencija pomaganja javno, ostvaruju niske pozitivne korelacije sa gomilanjem zaliha, dok altruizam ostvaruje nisku negativnu korelaciju. Dobijene korelacije ostaju značajne i nakon kontrole efekta veličine domaćinstva. Međutim, u regresionoj analizi, samo adaptivna sebičnost ostvaruje mali ali značajan efekat na gomilanje zaliha, povrh varijanse veličine domaćinstva. Rezultati pokazuju da strah u vezi s pandemijom nije povezan sa gomilanjem zaliha, što ukazuje na to da se gomilanje zaliha može shvatiti kao forma sebičnog ponašanja.

Ključne reči: gomilanje zaliha, pandemija COVID-19, prosocijalne tendencije, sebičnost, strah

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Format rada. Rad mora biti napisan u tekst procesoru Microsoft Word, na stranici formata A4, fontom Times New Roman ili Cambria (12 tačaka), latinicom, sa razmakom od 1.5 reda, sa marginama od 2.54 cm (odnosi se na sve margine). Rad treba da bude dužine do jednog autorskog tabaka (do 30000 znakova, sa razmacima, bez referenci i priloga), a ukoliko je reč o kratkom izveštaju, rad treba da bude do 5 000 znakova (s razmacima) bez referenci i priloga. Redni brojevi strana treba da budu dati u gornjem desnom uglu, zajedno sa zaglavljem koje sadrži skraćeni naslov rada (tzv. *running head*), pisan velikim slovima, bez imena autora. Zaglavlje ne sme imati više od 50 karaktera. Paginacija bi trebalo da počinje od prve strane. Rad treba da bude struktuiran u skladu sa IMRAD formatom i pravilima koja su definisana u **7. izdanju Priručnika Američke psihološke asocijacije (*APA Publication Manual*)**.

Shodno tome, rad treba da sadrži odeljke *Rezime* sa ključnim rečima, *Uvod*, *Metod*, *Rezultati*, *Diskusija*, *Zaključak* (opciono), *Reference*, *Prilozi* (opciono), kao i naslov i rezime sa ključnim rečima na engleskom jeziku.

Naslovna strana. Naslov treba da bude što koncizniji, ali i dovoljno precizan. Preporuka APA standarda je da naslov ne sadrži više od 15 reči. Ukoliko se u članku izveštava o nekom instrumentu koji nije opštepoznat široj naučnoj i stručnoj javnosti, naziv instrumenta je potrebno navesti u celini u naslovu rada, a ne samo skraćenicu. Ukoliko je rad nastao u sklopu projekta, iza naslova rada treba staviti fusnotu koja sadrži naziv finansijera projekta i broj projekta. Ukoliko je deo rezultata izlagan na skupu, u fusnoti treba dati podatke o skupu. Iza naslova rada slede imena autora i njihove afilijacije. Iza imena autora za korespondenciju treba staviti fusnotu koja sadrži e-mail adresu autora. Naslov rada, imena autora i afilijacije autora daju se na prvoj strani, bez ostatka teksta. Ova strana se, kao poseban dokument, prilaže na platformu, odnosno odvojeno od samog rukopisa.

Rezime. Rezime treba da bude dužine do 250 reči. Na kraju rezimea treba dati ključne reči (do pet ključnih reči). Ukoliko je rad na srpskom jeziku, potrebno je priložiti naslov, rezime i ključne reči i na engleskom jeziku. Rezime po pravilu ne sadrži reference, sem ukoliko je to neophodno.

Naslovi odeljaka. Naslovi odeljaka (*Metod*, *Rezultati* i sl.) pišu se **podebljanim** slovima, „rečeničnim" formatom (velikim početnim slovom), centrirano. Naslovi drugog nivoa se pišu **podebljanim** slovima, poravnato u levo i u „rečeničnoj" formi. Naslovi trećeg nivoa pišu se poravnato u levo (***podebljano, italikom*** u „rečeničnoj" formi). Naslovi četvrtog nivoa se pišu **uvučeno** u odnosu na levu marginu, u rečeničnom formatu, **podebljano i s tačkom na kraju**. Naslovi petog nivoa, se pišu **uvučeno** u odnosu na levu marginu, u rečeničnom formatu, ***podebljano, italikom i s tačkom na kraju***. Nazive instrumenata, u odeljku Metod, treba navoditi kao subordinirane podnaslove u okviru odeljka *Instrumenti*.

Formatiranje naslova i podnaslova

Nivo naslova	Format
1	**Metod**
2	**Instrumenti**
3	***Velikih pet plus dva***
4	**Verzije za decu.**
5	***Procena roditelja.***
	Procena učitelja.

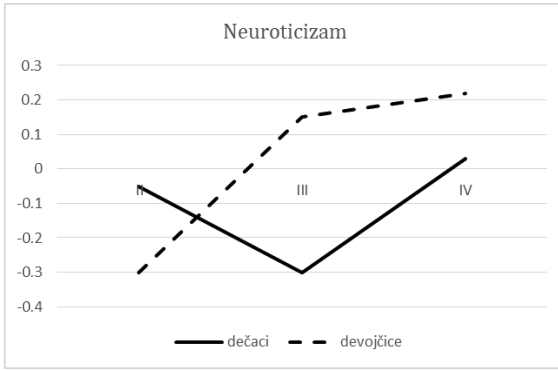
Tabele. Tabele i grafikoni treba da budu sačinjeni u Wordu ili nekom Word-kompatibilnom formatu. Tabele i grafikone iz statističkih paketa treba prebaciti u Word. Iste podatke ne treba istovremeno prikazivati i tabelarno i grafički. Podaci koji su već dati u tabeli ili na grafikonu, ne smeju se ponavljati u tekstu, već se treba samo pozvati na njih. Tabele i grafikone je potrebno pozicionirati u samom radu, odnosno nije potrebno da se prilažu kao posebni dokumenti na platformu, već u sklopu rukopisa. Svaka tabela treba da bude označena brojem i adekvatnim nazivom. Broj tabele treba da bude napisan običnim slovima, a naziv tabele treba da bude dat u sledećem redu, *kurzivom*. Broj i naziv tabele nalaze se iznad tabele, poravnati u levo. Tabele ne smeju da sadrže vertikalne linije. Redovi tabele ne treba da budu razdvojeni linijama, ali zaglavlje tabele mora da bude linijom odvojeno od ostalih redova. Vrednosti u tabelama bi trebale da budu date u sredini kolone, sa decimalnim mestima pozicioniranim levim tabulatorom.

Korektan prikaz tabele:
Tabela 1
Korelacije nasilnog ponašanja i komponenti ispitne anksioznosti

	Fizičko nasilje	Verbalno nasilje	Relaciono nasilje
Zabrinutost	-.23**	-.24**	-.14*
Negativna emocionalnost	.27**	.36**	.24**

Napomena. * $p < .05$. ** $p < .01$.

Grafikoni i slike. Slike treba slati u elektronskoj formi sa rezolucijom od najmanje 300 dpi. Štampa časopisa je crno-bela, pa se autori mole da prilagode tabele, grafikone i slike crno-beloj štampi. Ukoliko se koristi ilustracija iz štampanog izvora nužno je pismeno odobrenje vlasnika autorskih prava. Naziv slike treba da bude prikazan ispod slike nakon oznake rednog broja. Na primer:



*Slika 1***.** Interakcija pola i razreda kod učenika ranog osnovnoškolskog uzrasta: dimenzija Neuroticizma.

Rezultati statističke obrade. Rezultati statističkih testova treba da budu dati u sledećem obliku: $F(1, 9) = 25.35$, $p < .001$ i slično za druge testove (npr. $\chi^2(5, N = 454) = 5.311$, $p > .10$ ili $t(452) = 2.06$, $p < .05$). Treba navoditi manji broj konvencionalnih *p* nivoa (.05, .01 ili .001). Ukoliko je broj teorijski manji od 1 (npr. α, *r*, opterećenja u faktorskoj analizi, *p* nivo i sl.), nula se ne stavlja ispred tačke. Po pravilu, nazivi statističkih testova i oznaka treba da budu napisani u *kurzivu*, sem ako je reč o grčkim simbolima koji se **ne pišu** u kurzivu.

Decimalni brojevi. Uvažavajući statističke konvencije, decimalne brojeve treba pisati sa tačkom. Sve decimalne zapise treba zaokružiti na dve decimale, sem kada se navode indikatori fita, *p* nivo značajnosti i sl. gde je i podatak o razlikama na trećoj decimali bitan.

Navođenje referenci u tekstu. Imena stranih autora navode se u originalu, npr. Dimanche (1990), ili kada je potrebno u padežnom obliku „...rezultati Dimanchea (Dimanche, 1990)...", s tim što je onda potrebno u zagradu staviti referencu. Ukoliko referenca ima **dva autora**, oba se navode u tekstu, npr. (Costa & McCrae, 1992). Ukoliko je u pitanju domaća referenca, umesto znaka „&" navodi se „i", npr. (Jovanović i Petrović, 2011). Ukoliko rad ima **3 ili više autora**, u svakom navodu se pominju samo prezime prvog autora i skraćenica „et al." za strane reference, ili „i sar." za domaće. Na primer, na engleskom jeziku, prvi, i svaki sledeći navod bi imao formu (Roberts et al., 2004). Na srpskom jeziku, prvi, i svaki sledeći navod bi imao formu (Novović i sar., 2011). Ukoliko dva rada iz iste godine imaju istog prvog autora, a ostali su različiti, treba navesti onoliko imena autora koliko je potrebno da bi se reference mogle jasno razlikovati u tekstu. Na primer, reference (Black, White, Brown, & Green, 1991) i (Black, Brown, White, & Green, 1991) imaju istog prvog autora i istu godinu izdanja. U ovom slučaju, u tekstu bi se navodile kao (Black, White, et al., 1991) i (Black, Brown, et al., 1991).

Doslovno citiranje. Svaki citat koji je direktno preuzet iz teksta, bez obzira na dužinu, treba da prati referenca sa brojem strane. Za svaki citat duži od 350 znakova autor mora imati pismeno odobrenje vlasnika autorskih prava koje treba da priloži.

Spisak referenci. U spisku literature navode se samo reference na koje se autor pozvao u radu, abecednim redom po prezimenima autora. Ukoliko rad sadrži nekoliko referenci čiji je prvi autor isti, najpre se navode radovi u kojima je taj autor jedini autor, po rastućem redosledu godina izdanja, a potom se navode radovi u odnosu na abecedni red prvog slova prezimena drugog autora (ukoliko ima koautore). Ukoliko se navodi više radova istog autora u jednoj godini, godine treba da budu označene slovima a, b, c, npr. (1995a), (1995b). Za svaku referencu u popisu literature potrebno je navesti i **DOI broj**, ukoliko je dostupan. Na stranici https://www.crossref.org/requestaccount/, nakon otvaranja svog naloga, možete pronaći DOI broj za većinu dostupnih članaka. DOI broj se nalvodi u formatu linka: https://doi.org/10.1016/j.paid.2015.04.039

Monografija (knjiga). Bibliografska jedinica knjige treba da sadrži prezime i inicijale autora, godinu izdanja, naslov knjige (*kurzivom*) i izdavača, odnosno: Pantić, D. (1990). *Promene vrednosnih orijentacija mladih u Srbiji.* Institut društvenih nauka. Nazivi knjiga na engleskom jeziku pišu se u „rečeničnom" formatu, takođe u *kurzivu*. Ukoliko naziv knjige ima podnaslov, on može počinjati velikim slovom.

Zbornik u celini. Ukoliko se kao referenca navodi zbornik radova u celini, referenca ima sledeću formu: Biro, M., Smederevac, S. i Novović, Z. (Ur.) (2010). *Procena psiholoških i psihopatoloških fenomena.* Centar za primenjenu psihologiju.

Poglavlje u knjizi ili zborniku navodi se na sledeći način: Day, R. L. (1988). Measuring preferences. In R. Ferber (Ed.), *Handbook of marketing reasearch* (pp. 112-189). McGraw-Hill. Naslovi stranih knjiga i zbornika treba da budu dati u „rečeničnoj formi", sa početnim velikim slovom i ostalim malim. Ukoliko rad ima podnaslov, on se od naslova odvaja sa dve tačke i počinje velikim slovom. Ukoliko zbornik ima samo jednog urednika, umesto Eds. se navodi oblik jednine Ed. U domaćim referencama ovog tipa, strana skraćenica Ed. ili Eds. treba da glasi „Ur.", a skraćenica „In" - „U".

Članak u časopisu treba da sadrži prezimena i inicijale autora, godinu izdanja u zagradi, naslov članka, puno ime časopisa (*kurzivom*), volumen (*kurzivom*), stranice, i doi specifikaciju, odnosno: Orbach, L., Herzog, M., & Fritz, A. (2019). Relation of state- and trait-math anxiety to intelligence, math achievement and learning motivation. *Journal of Numerical Cognition, 5*(3), 371–399. https://doi.org/10.5964/jnc.v5i3.204. Nazivi članaka pišu se u „rečeničnom" formatu, u kom je samo prvo početno slovo veliko. Nazivi časopisa na engleskom jeziku pišu se tako da početna slova svih reči, izuzev veznika, budu velika. Nakon prezimena autora, uvek se stavlja zarez, kao i nakon inicijala (ukoliko ima više inicijala imena, zarez se stavlja nakon svih inicijala zajedno, a ne nakon svakog posebno). U domaćim referencama, znak „&" treba zameniti veznikom „i". Referenca rada objavljenog u časopisu koji se izdaje isključivo u elektronskoj formi ima iste elemente kao referenca rada iz štampanog časopisa, ali se nakon broja stranica navodi „Retrieved from" (za domaće reference „Preuzeto sa") i web adresa: Sillick, T. J., & Schutte, N. S. (2006). Emotional intelligence and self-esteem mediate between perceived early parental love and adult happiness. *E-Journal of Applied Psychology, 2*(2), 38–48. Retrieved from http://ojs.lib.swii.edu.au/index.php/ejap Kada je reč o **web dokumentu ili stranici**, navodi se ime autora, godina, naziv dokumenta (*kurzivom*), datum kada je sajt posećen, i internet adresa sajta, npr. Degelman, D. (2000). *APA Style Essentials.* Retrieved May 18, 2000 from: http://www.vanguard.edu/psychology/apa.pdf

Navođenje **nepublikovanih radova** (npr. rezimea sa naučnog skupa, manuskripta i sl.) nije poželjno. Ukoliko je takvo navođenje neophodno, treba

navesti što potpunije podatke, kao u sledećem primeru: Smederevac, S. (2000). *Istraživanje faktorske strukture ličnosti na osnovu leksičkih opisa ličnosti u srpskom jeziku* (Nepublikovana doktorska disertacija). Filozofski fakultet, Univerzitet u Novom Sadu.

Prevod referenci. Ukoliko se na recenziju predaje rad na engleskom jeziku i pri tome se citiraju reference na srpskom, potrebno je dati engleski prevod citiranih naslova u uglastim zagradama: Padejski, N., & Biro, M. (2014). Faktori vulnerabilnosti za postraumatski stresni poremećaj kod žrtava partnerskog nasilja [Vulnerability factors for posttraumatic stress disorder in victims of intimate partner violence]. *Primenjena psihologija, 7,* 63–85. https://doi.org/10.19090/pp.2014.1.63-85

Prilog. U priloge treba staviti samo one opise materijala koji bi bili korisni čitaocima za razumevanje, evaluiranje ili ponavljanje istraživanja.

Fusnote i skraćenice. Fusnote treba izbegavati. Skraćenice takođe treba izbegavati, osim izrazito uobičajenih. Skraćenice koje su navedene u tabelama i slikama treba da budu objašnjene. Objašnjenja (legenda) se daju ispod tabele ili slike.