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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).

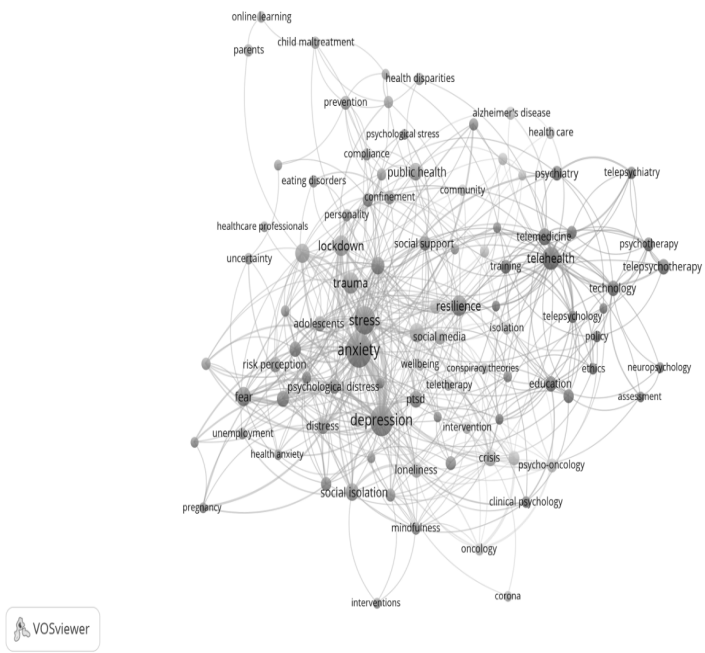

Figure 1. The coincidence map of keywords forming clusters of various psychological research topics related to the COVID-19 pandemic

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 ($M_{DIF} = 1.40$, $d = .889$).

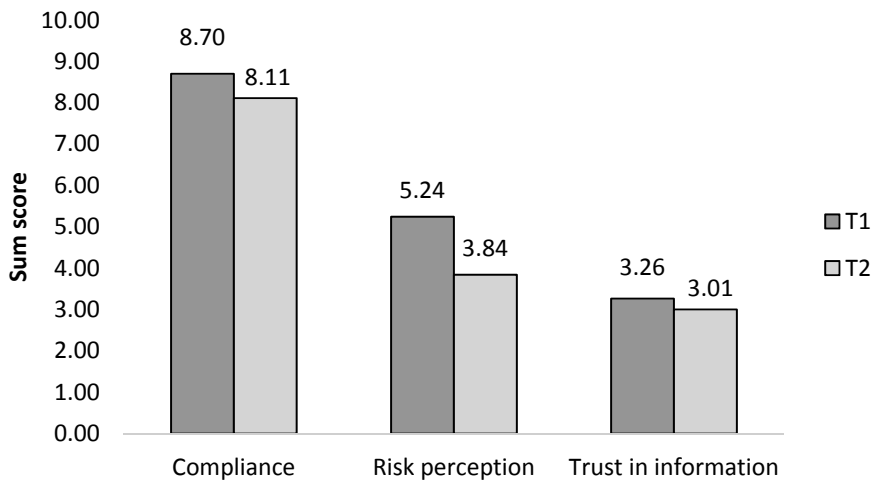

Figure 2. Differences between T1 and T2 for compliance, risk perception and trust in information.

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