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Positive personality resources as buffers against psychological reactions to uncertainty

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Abstract
Since March 2020, Russia has been facing three lasting challenges of uncontrollable threat and uncertainty: the COVID-19 pandemic taking place at the global scale, and two national-level ones, the radical amendments to the Constitution and a drop in oil prices and national currency. We used this opportunity to investigate the way personality resources predict individual differences in the cognitive evaluations of uncertainty and emotional responses associated with each situation. We conducted a longitudinal study with 4 measurement waves between April and November 2020 in a sample of Russian-speaking volunteers (N = 219). The assessment of each of the three situations at each measurement occasion included the evaluation of its degree of certainty/uncertainty, general orientation, positive and negative emotions. We used repeated-measures ANOVA to explore the differences in cognitive appraisals and emotional reactions across time and situations, and multilevel modeling with random slopes to investigate the individual differences in the change trends for these variables. The results suggest that individuals with higher levels of personality resources tend to appraise the challenging situations as more certain, have a better sense of orientation in these situations, show more positive emotional responses, and exhibit more positive change trends over time reflecting successful adaptation.

Keywords Uncertainty · COVID-19 · Positive personality resources · Tolerance for ambiguity · Emotions

Introduction

The challenge of uncertainty

The key problem of the study presented in this paper is the way persons face the challenges associated with uncertainty. Growing uncertainty is often mentioned as characteristic of our century; in psychology, however, we can hardly speak of regular research in this field. Still, psychology has much to offer.

Uncertainty can be generally defined in terms of unpredictability, complexity, and insolubility (Krohne, 1993). This issue has been most prominent in existential psychology, which is based on the premise of uncertainty as a normal and inevitable reality of human life (Spinelli, 2007; Leontiev, 2015). Existentialism treats life as an ultimate uncertainty, where certainty can only be created by the person who acts at their own risk, scarcely being sure of doing the right thing, but who engages in dialogue with fellow human beings to develop a sense of subjective certainty.

(Alquist & Baumeister, 2022) in their comprehensive review draw an important distinction between the subjective and the objective uncertainty: the former is produced by the lack of information about the world, while the latter is inherent in the objective reality. Objective uncertainty challenges the person's agency, because active efforts may affect the outcome, while subjective uncertainty provokes avoiding definite decisions, for the lack of information increases the risk of an error. The authors argue that uncertain situations attract more attention and provoke more emotional responses.

Uncertainty, thus, emerges as a challenge that requires authenticity, responsibility, courage to endure anxiety, cooperation, meaning, and a range of other resources to cope with it. Successful coping with uncertainty implies staying in contact with the ambiguous reality, rather than

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trying to avoid it, and trying to create certainty responsibly. Our capacity to withstand uncertainty is one of the most important existential characteristics necessary to master the numerous challenges life can pose (Maddi, 2013). It is personality resources in charge of this capacity which are the main target of our study. Some of them have a long history of empirical research.

Personality resources for coping with uncertainty

Most often the capacity to withstand uncertainty has been studied as a specific personality disposition labeled tolerance for uncertainty or tolerance for ambiguity. Research into individual differences in tolerance for uncertainty began in the 1940s, with the work of Frenkel-Brunswick (1948, 1949) who proposed a single individual difference variable behind the denial of emotional ambivalence and intolerance towards cognitive uncertainty. Various models of tolerance and intolerance of uncertainty have been developed since (see Furnham & Marks, 2013, for a review), showing that tolerance for ambiguity is an important personality resource that is associated with a range of positive cognitive and behavioral outcomes, such as openness to experience, cognitive flexibility, proactivity, entrepreneurial performance, and mental health, among others.

More recently, other individual difference models of trait-like personality resources have been proposed, where tolerance for uncertainty is not pointed out as a defining characteristic, but, rather, is proposed as a functional outcome. These models include hardiness (Maddi, 2004) and sense of coherence (Antonovsky, 1993). Hardiness is an operationalization of existential courage which aims to capture the dispositions that enable individuals to make autonomous and meaningful choices when faced with the uncertainty of future outcomes (Maddi, 2013). Sense of coherence is a general confidence that life environments are predictable and manageable (Antonovsky, 1993). Both dispositions have been shown to play an important role in prevention of stress and effective coping with uncertain situations at work or in the health domain (Eschleman et al., 2010; Eriksson & Lindström, 2006). We find it worthwhile to take these variables into consideration.

Other personality variables relevant for coping with uncertainty refer to agency which can hardly be reduced to a single trait-like variable. As mentioned above (see Alquist & Baumeister, 2022) agency plays a critical role as a resource of dealing with objective uncertainty. In our study the resource of agency is represented by three instruments measuring its different aspects. The one is a well-known construct of self-efficacy, which refers to an individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments (Bandura, 1997). The second refers to fundamental beliefs about the freedom vs. determination of human action. It has been stated more than once that the belief in free will is conducive to the outcomes related to the motivation and efficacy of human actions. Another belief which seems highly relevant for our research design is the belief in ultimate unpredictability; both beliefs are included into Freedom and determinism inventory (FAD-Plus) by Paulhus and Carey (2011). The third account of human agency is presented in the concept of personal life position (PLP) defined as the person's attitude to one's own life. Three aspects of PLP are being distinguished: agency, or activity with regard to one's life, awareness or self-reflection and authenticity, or the feeling of harmony with one's life (Leontiev & Shilmanskaya, 2019). We have good reasons to view the list of personality resources we take into consideration in our study as representative, though not complete; it will be a task for the future to extend this list.

The findings of various studies, some of which will be briefly overviewed in the next section, suggest that individual differences in personality resources that determine the appraisal of uncertainty and responses to uncertain situations emerge as important predictors of coping with these situations and well-being at large. We have not met, however, research which would systematically investigate the contribution of personality resources to reactions to different situations of major life uncertainty, especially in their temporal dynamics. These personality variables could include trait tolerance for uncertainty, as well as variables related to agency, such as hardiness, belief in free will, self-efficacy, sense of coherence, and subjective vitality.

In the present study, we set out to explore the effects of these individual differences across three specific contexts, all of them referring to ecologically valid, real-life situations our participants have been facing. The study is the first one to consider different types of uncertain situations, different types (cognitive and emotional) of appraisals of these situations, and a range of personality predictors that could explain the individual differences in these appraisals and in their temporal dynamics.

Uncertainty in the context of the COVID pandemic

During 2020, the entire humanity encountered one of the most stressful challenges in the last decades. The challenge of the COVID-19 pandemic is of an existential nature with its multiple aspects related to the most fundamental issues of human existence -- the issues of time, life and death, the issues of freedom, responsibility, and choice, those of communication, love and isolation, and, finally, the issues of meaning and meaninglessness (Yalom, 1980).

One important aspect of the COVID challenge is that of uncertainty: it is quite hard to predict exactly how the situation is going to develop. Recently, the phenomena of uncertainty associated with the COVID pandemic have attracted

research attention in economics (Altig et al., 2020; Baker et al., 2020; Caggiano et al., 2020), sociology (Brown & Galantino, 2020) and, most notably, in the public health domain (Koffman et al., 2020; Bryce et al., 2020). The effects of tolerance of uncertainty have been much investigated worldwide within the context of the COVID pandemic. Freeston and colleagues (Freeston et al., 2020) have proposed a model of uncertainty distress, suggesting that the effects of actual life uncertainty on perceived uncertainty and the subsequent distress are moderated by dispositional intolerance of uncertainty. In one study, intolerance of uncertainty related to COVID-19 was associated with general intolerance of uncertainty, anxiety, fear of illness, and eating disorders (Scharmer et al., 2020). In another study, dispositional intolerance of uncertainty was associated with fear of COVID-19, depression, anxiety, stress, and, inversely, with positivity (Bakioğlu et al., 2020). Two studies in Turkish samples have confirmed the negative associations of intolerance of uncertainty with mental well-being and found they were explained by rumination and fear of COVID-19 (Satici et al., 2020; Deniz, 2021). Fear of COVID-19 and depression mediated the association of intolerance of uncertainty with emotional eating (Pak et al., 2021). Another study has found that the associations of intolerance of uncertainty with anxiety and depression during the COVID pandemic were explained by maladaptive coping strategies, such as denial, self-blame, substance use, venting, behavioral disengagement, and self-distraction (Rettie & Daniels, 2021). Intolerance of uncertainty predicted conspiracy beliefs (government malfeasance, control of information) and moderated their effect on non-compliance with social distancing measures (Farias & Pilati, 2021).

The findings of recent studies suggest that personality resources as well as an active position of an individual towards crisis play an important role in coping with stress and uncertainty. Two studies (Yidirim & Güler, 2021; Yidirim & Arslan, 2020) have investigated the mediating role of hope and resilience between coronavirus anxiety and fear of COVID-19. The results have shown that hope helps to cope with pandemic and its detrimental effects through resilience. It was also considered that maintaining and reinforcing an individual's faith in his/her resilience and strength is a more effective way of enforcement of precautionary rules than escalation of fear (Nestik, 2020). One of the most important personality resources that determined the successful regulation of psychological processes and states in a coronavirus situation was the internal locus of control (Emelyanova et al., 2020). Internality ensures psychological, social, and emotional well-being in a pandemic. More successful coping was also associated with higher levels of self-efficacy and personal initiative, openness to new experiences and curiosity, belief in rewarding efforts and a just world, trust in others and science, optimism, etc. Generally, it is suggested that people who believe in their capacity to influence their life, cope with COVID-19 uncertainty in a more effective way (Krampe et al., 2021).

The context of the present study: COVID and other 2020 uncertainties in Russia

The challenge of uncertainty associated with the COVID-19 pandemic was the main target of our study. In Russia, however, the pandemic was not the only major challenge for the population in 2020. Some other major challenges which took place in this country through 2020 made it possible to also consider the type of challenging situation as an additional independent variable. We used the opportunity to compare the emotions and other subjective reactions to uncertainty across different situations, to investigate their diachronic dynamics, and to find out the role of positive psychological resources as buffers against the negative psychological consequences of these challenges.

Russia is one of the countries significantly affected by the COVID-19 pandemic. According to the World Health Organization statistics (WHO, 2020), between January and December 2020, there were 3,159,297 confirmed cases of COVID-19 in Russia with 57,019 deaths. Russia was at that time rated 4th on the registered number of cases and 9th on the number of deaths. As in many countries, emergency measures have been introduced, including movement restrictions, cancellations of public events, and transition of many institutions to distance-based work. The spread of the pandemic in Russia was registered in mid-March 2020, and the first emergency measures announced at the end of March. By coincidence, two other uncertainty-producing events occurred at the same time with potentially lasting consequences for the population.

The second event referred to radical amendments to the Russian Constitution proposed somewhat unexpectedly by President Vladimir Putin. In January 2020, Putin dismissed the government and proposed a number of amendments to 41 articles of the Constitution allowing him to run for two more six-year presidential terms, introducing additional restrictions on eligibility to run for president, explicitly mentioning patriotism and religious faith, and placing the national Constitution above international law. A controversial national vote was held during the pandemic in order to legitimize the amendments (New York Times, 2020).

The third event referred to the fall in the market prices of oil, which happened between January and April 2020, when Urals crude oil price had fallen from $61.7 to $18.2 per barrel (Statista, 2021). Since Russian economy is largely based on oil export, this fall of the prices was followed by a 22% drop of the ruble exchange rate (from 61.78 RUB per USD in January to 75.23 in April), which

resulted in price increases for many categories of goods and services (RBC, 2020).

Together, these three events produced an outburst of uncertainty in the public health, political, and economic domains, respectively. We used this opportunity to investigate the way personality resources can buffer against negative emotions and helplessness due to uncertainty.

The present study

Aims

The general aim of the research was to investigate the way personality resources contribute to individuals' ability to face and withstand uncertainty in situations of multiple crises. The study used a repeated-measures design with three situations (within-subject factor) and four measurement waves. More specifically, we explored: (1) the differences in the three types of appraisals of three situations of uncertainty ("COVID-19", "Constitution", "Oil prices"). We considered as DV, first, the evaluations of subjective certainty/uncertainty of the situations in question (the cognitive appraisal), second, emotions aroused by the situations (the affective appraisal) and, third, the subjective orientation as regards dealing with the situations (the conative appraisal); (2) the dynamics of these appraisals across four measurement occasions that took place in early April (T1), early May (T2), mid-June (T3), and mid-October 2020 (T4) (please, see Supplementary materials); (3) the individual variability in the appraisals of these situations and the associations of personality resources with the parameters of this dynamics.

Methods

Sample

We used online snowball sampling to obtain a sample of anonymous Russian volunteers (N = 219). The participants were recruited through social networks. They were mostly female (n = 139, 77%) aged between 18 and 72 (M = 40, SD = 12.9). Most had completed a university degree (73%), and some had a postgraduate degree (13%).

At the initial point of data collection, the respondents reported that their financial position due to the events of last month either had not changed (41%), or had become worse (35%), attitude towards authorities had not changed (36%), or had become worse (27%), and health status had not changed (34%), or had become worse (44%).

Procedure

The invitation to participate in a research survey of attitudes towards certainty and uncertainty was posted on social networks (Facebook and Vkontakte). The research was conducted online using the 1 ka.si platform. Informed consent was obtained from all participants. For the follow-up data collection, the participants were contacted by email they provided at T1. No payment was offered for participation in the study. As a reward, as well as to minimize attrition and to maintain the motivation of respondents to participate in further stages of the study, all the participants who completed the study at T3 and T4 were offered a free popular psychology e-book of their choice provided by a national publisher.

The study did not involve any interventions. It was conducted in accordance with the Declaration of Helsinki and national ethical requirements. Informed consent was obtained from all participants. The study was approved by the Commission for Ethical Evaluation of Empirical Research Projects, Department of Psychology, HSE University.

Instruments

The survey consisted of three blocks: demographics, appraisals of three situations of uncertainty ("COVID-19", "Constitution", "Oil prices"), and personality measures (T1 only). The demographic section included questions tapping into age, gender, region of residence, education, occupation, and assessment of the impact of the events of the last month on the financial situation, health status, and attitudes towards the authorities.

The challenging situations were presented as follows:

> *Situation A "COVID-19"*: "The world is facing the COVID-19 (coronavirus) pandemic. As a result, in Russia, as in other countries, emergency measures are being introduced, communication and movement of people are limited, many institutions are temporarily closed, and events are canceled or postponed."
> *Situation B "Constitution"*: "In January, President Vladimir Putin dismissed the government, proposed a number of significant amendments to the Russian Constitution, and appointed a referendum on the proposed amendments."
> *Situation C "Oil prices"*: "In March, the collapse of world oil prices began, which has led to a sharp drop in the ruble exchange rate that continues to this day."

The appraisal of each situation was measured with several variables. First, we asked the respondents to evaluate the certainty of each situation ("COVID-19", "Constitution",

"Oil prices") on a scale from 1 "completely vague/unclear/incomprehensible situation" to 10 "a very clear/understandable/definite situation".

Next, we measured a general orientation in each crisis situation, that is, the degree of confidence in one's understanding of the situation and in the way to respond to it. This variable was specified by four statements that respondents were asked to evaluate using a 5-point Likert-type scale from 1 "Disagree Strongly" to 5 "Agree Strongly": "I know the causes of the situation" – orientation in the past; "I know how to act in this situation" – orientation in the present; "I know how the situation will develop further in the next 1–2 months" – orientation in the future; "I feel capable to cope with the consequences of this situation" – self-confidence orientation (from 1 "definitely worse than others" to 5 "definitely better than others"). Based on exploratory factor analyses, we treated the four items as indicating the single construct, orientation in a situation of uncertainty ($\alpha = 0.65$).

Finally, we assessed the emotional reactions people might experience in each of the three situations ("Please evaluate the extent to which you experience each of the following feelings with respect to this situation using a scale from 1 – do not experience at all to 5 – definitely experience"): confusion, mobilization, anxiety, guilt, confidence, calm, irritation, fear, interest, anger, excitement, joy, sadness, surprise, disgust. Based on exploratory factor analyses, we grouped the emotions into three factors: positive emotions ($\alpha = 0.65$, including: mobilization, confidence, interest, excitement, joy, surprise); active negative emotions ($\alpha = 0.82$, including irritation, anger, disgust); and passive negative emotions ($\alpha = 0.80$, including confusion, anxiety, guilt, fear, sadness, and calm, reverse-scored).

The instruments addressing personality characteristics were presented only at T1 and included the following measures:

Multiple Stimulus Types Ambiguity Tolerance Scale (MSTAT-II: McLain, 2009; Russian version by Leontiev et al., 2016). The instrument includes 13 items ($\alpha = 0.88$) reflecting positive and negative attitudes towards complex, uncertain, and ambiguous situations rated on a 5-point Likert scale.

Personal Life Position Inventory (Leontiev & Shilmanskaya, 2019) is an original 12-item inventory measuring individuals' stance towards their lives. The items are grouped in three scales: harmony vs. discord with one's life ($\alpha = 0.88$, sample item: "I feel harmony with my life") which reflects an affective component of life position, reflective awareness of one's life vs. being mindless about it ($\alpha = 0.58$, sample item: "One must try to understand what's happening with him/her") which reflects a cognitive component of life position, and active control (agency) over the course of one's life vs. passivity ($\alpha = 0.68$, sample item: "People could change a lot in their lives if they wanted to") which reflects a conative component of life position.

Freedom and Determinism Beliefs Inventory (FAD-Plus: Paulhus & Carey, 2011; Russian version by Mospan & Leontiev, 2021) includes 27 items measuring lay beliefs in free will ($\alpha = 0.58$) and alternative beliefs: in scientific determinism ($\alpha = 0.61$), fatalistic determinism ($\alpha = 0.77$), and unpredictability ($\alpha = 0.74$).

State Subjective Vitality Scale (SVS: Ryan & Frederick, 1997; Russian adaptation by Aleksandrova, 2014) measures the perceived level of vital energy of a person at the moment. The scale consists of 7 items ($\alpha = 0.91$) evaluated on a 7-point scale.

Hardiness Test (Leontiev & Rasskazova, 2006; Osin & Rasskazova, 2013), based on the Personal Views Survey (Maddi, 1999), consists of 24 items evaluated on a 4-point scale measuring three attitudinal components of hardiness, commitment (a tendency to be involved in life events), control (a tendency to influence things), and challenge (a tendency to view changes as opportunities, rather than threats). For the present study, we only used the general index ($\alpha = 0.92$).

Generalized Self-efficacy Scale (Schwarzer et al., 1996), a 10-item instrument with a 4-point response scale ($\alpha = 0.85$) measuring a subjective assessment of one's general ability to cope with life challenges and to successfully achieve one's goals.

Sense of Coherence scale (SOC: Antonovsky, 1984; Russian adaptation by Osin, 2007) measures a general orientation of the individual, reflecting a stable and dynamic sense of comprehensibility (a belief that life events are ordered and predictable), manageability (a belief that one has the resources to cope with the environment's demands) and meaningfulness (a belief that things in life are interesting and worthwhile). In the present study, we used a brief 13-item version of the questionnaire ($\alpha = 0.82$) with a 7-point scale.

Data analysis

In order to analyze the differences in the appraisals of three situations of uncertainty ("COVID-19", "Constitution", "Oil prices") and the dynamics of these appraisals in time we used repeated-measures ANOVA in Jamovi 1.2.27 (The jamovi project, 2020) for three principal outcomes, the evaluation of certainty, general orientation in the situation, and emotions.

Next, we used multilevel analysis in MPlus 8 (Muthén & Muthén, 2017) to investigate the associations of personality characteristics at T1 with the intercept and slope of outcome variables. We performed this analysis for each situation

separately, aiming to separate the variance associated with differences across time points (Level 1, L1) and between individuals (Level 2, L2).

Initially, the study was conducted with 4 time points. However, the longer time interval between the third and the fourth time points (29 weeks), as well as preliminary descriptive analyses revealed that the situations may have qualitatively changed. Based on this, as well as the smaller sample size at the final time point T4, which would have reduced the statistical power, we decided to only use the first 3 time points. As a measure of time, we used the difference in weeks (integer) between the beginning of the data collection and each time point (0 for T1, 4 for T2, and 13 for T3).

Out of 219 participants who completed the survey at the first time point, 52 had complete data, 101 were missing at Time 2, 135 at Time 3. We used a multilevel regression model with random slopes, allowing the slopes of each dependent variable (assessment of certainty, general orientation, and emotional reactions) as a function of time to vary across individuals. Next, using the Pearson correlation coefficient we investigated whether individual differences in personal characteristics were associated with the individual differences in the estimates of slopes and intercepts derived from the multilevel model.

We expected that higher levels of personality resources would be positively associated with the intercepts of certainty, orientation, and positive emotions, with an inverse pattern for negative emotions. For the slopes, we expected that individuals with higher personality resources would experience faster (or more pronounced) change in the direction reflecting a successful adaptation (increase in certainty, orientations, positive emotions) and slower (or less pronounced) change in the direction reflecting adaptation difficulties (negative emotions).

Results

Difference in appraisals of challenging situations

First, we used one-way ANOVA to compare the appraisals of the three situations of uncertainty at T1. Table 1 provides the descriptive statistics for the evaluation of certainty, orientations, and emotions across the three situations: "COVID-19", "Constitution", "Oil prices". The differences in the evaluation of certainty across the three situations were weak, but statistically significant. Situation B ("Constitution") was perceived as more certain than the other two situations ("COVID-19" and "Oil prices") that did not differ significantly from each other in this respect.

Situation A ("COVID-19") was characterized by a certain gap between knowledge about the causes/consequences of the situation and one's own actions in the conditions of uncertainty: participants reported knowing what to do, despite not knowing the causes of the situation and not being sure of its future development. The other two situations showed a much smaller gap between these appraisals. Across the situations, the appraisals of certainty of the past, present, and self-confidence to cope were the highest for Situation A ("COVID-19"), whereas certainty appraisals regarding the future were the highest for Situation B ("Constitution"). At the following stages of the analysis, we combined the appraisals of certainty of the past, present, future,

Table 1 The comparison of the situations by parameters of certainty, orientations and emotions

Variable	Situation A "COVID-19" M (SD)	Situation B "Constitution" M (SD)	Situation C "Oil prices" M (SD)	Effect size, eta-squared
Certainty	5.37 (2.86)	5.99 (2.59)	5.42 (2.81)	0.010*
General orientation	3.28 (0.70)	2.97 (0.86)	2.69 (0.77)	0.087***
Orientation in the past	3.38 (1.33)	3.07 (1.40)	3.06 (1.29)	0.012**
Orientation in the present	3.94 (1.02)	3.17 (1.36)	2.55 (1.19)	0.186***
Orientation in the future	2.38 (1.12)	2.52 (1.28)	2.14 (1.11)	0.018***
Orientation in self-confidence	3.42 (0.73)	3.13 (0.56)	3.02 (0.76)	0.059***
Positive emotions	2.60 (0.63)	2.12 (0.66)	2.01 (0.66)	0.138***
Negative active emotions	2.19 (0.93)	2.91 (1.45)	2.40 (1.21)	0.058***
Negative passive emotions	2.59 (0.83)	2.23 (0.83)	2.65 (0.89)	0.046***

$N = 219$. M = mean score. SD = standard deviation. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

and of one's confidence to cope into a single scale of general orientation to reduce the dimensionality of the data.

As for the content of emotional reactions (Table 1), we can conclude that each of the situations was characterized by a specific emotional response pattern. Situation A ("COVID-19") was mostly associated with positive emotions (mobilization, confidence, interest, excitement, joy, surprise) and passive negative emotions (confusion, anxiety, guilt, anxiety, fear, sadness). In Situation B ("Constitution"), active negative emotional reactions (irritation, anger, disgust) were the most common. For Situation C ("Oil prices"), passive negative emotions were most likely to occur.

The impact of personality variables on the dynamics of appraisals of the challenging situations

Finally, we ran a series of multilevel models using only the data from the first three time points in a subsample of individuals who completed the personality measures (N = 180). The intraclass correlation coefficients for the dependent variables ranged from 0.28 to 0.67, indicating a substantial contribution of individual differences to the evaluations of uncertainty, general orientation, and emotions.

For the evaluations of perceived certainty (see Table 2), self-efficacy showed significant correlations with the slope of the perceived certainty for all three situations. On average, the perceived certainty of Situation A ("COVID-19") decreased over time, but individuals with a high level of self-efficacy reported a weaker decrease. In turn, perceived certainty of Situations B ("Constitution") and C ("Oil prices") increased over time, and this increase was faster for participants with a higher level of self-efficacy. The slope of certainty appraisal for Situation B ("Constitution") was positively associated with a sentiment of harmony with one's life and belief in free will, whereas tolerance for ambiguity had significant positive correlations with the slopes for Situations A ("COVID-19") and C ("Oil prices").

The intercept of perceived certainty for Situation A "COVID-19" was higher for individuals with higher sense of coherence and vitality, whereas the intercept for situation B "Constitution" was higher for individuals with higher self-efficacy and belief in free will. All of these associations were consistent and went in the theoretically predicted direction.

Turning to the general orientation in situations of uncertainty (Table 3), we found positive associations for the slope of Situation A ("COVID-19"), indicating that the decline in the orientation was slower in participants with higher self-efficacy and belief in free will. The intercepts for the three situations were positively associated with belief in free will, tolerance for ambiguity, subjective vitality, self-efficacy, hardiness, and sense of coherence with only minor differences across situations. Again, the associations were all in the theoretically expected direction, indicating that participants with higher levels of personality resources were more likely to experience higher overall confidence concerning the situations of uncertainty.

Finally, we explored the relationships of personality resource variables with the dynamics of emotional reactions to the three challenging situations. The associations for positive emotions are presented in Table 4. None of the resources were associated with the slopes reflecting the linear change in emotional reactions. However, the overall experience of positive emotions was more common for respondents with higher levels of harmony with life and subjective vitality,

Table 2 Pearson Correlation coefficients between the perceived certainty of Situations A, B, C and personality variables

	Perceived certainty Situation A "COVID-19"		Perceived certainty Situation B "Constitution"		Perceived certainty Situation C "Oil prices"	
	Slope (dynamics)	Intercept (mean)	Slope (dynamics)	Intercept (mean)	Slope (dynamics)	Intercept (mean)
Descriptive statistics						
Minimum	-0.060	3.460	-0.020	3.30	0.01	3.22
Maximum	–0.020	7.40	0.150	8.30	0.04	8.02
Mean	-0.027	5.34	0.078	5.94	0.020	5.27
Standard deviation	0.012	0.938	0.024	1.24	0.004	1.09
Personality variable						
Self-efficacy	**0.234****	0.143	**0.150***	**0.188***	**0.169***	0.042
Harmony with life (Personal life position)	0.119	0.107	**0.151***	0.108	0.111	0.034
Sense of coherence	0.111	**0.156***	0.144	0.093	0.110	0.056
Subjective vitality	0.142	**0.175***	0.068	0.037	0.142	0.015
Tolerance for ambiguity	**0.161***	0.139	0.108	-0.029	**0.162***	-0.022
Free will (Freedom/Determinism Beliefs)	0.089	0.116	**0.230****	**0.149***	0.117	0.112

Only variables with significant correlations are presented in the table. Values in bold letters show significant correlations. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 3 Pearson Correlation coefficients between the general orientation in Situations A, B, C and personality variables

	Orientation in Situation A "COVID-19"		Orientation in Situation B "Constitution"		Orientation in Situation C "Oil prices"	
	Slope (dynamics)	Intercept (mean)	Slope (dynamics)	Intercept (mean)	Slope (dynamics)	Intercept (mean)
Descriptive statistics						
Minimum	-0.110	8.34	-0.210	7.15	-0.100	5.25
Maximum	0.070	17.0	0.320	17.1	0.160	16.7
Mean	-0.031	13.2	0.118	11.8	-0.007	10.7
Standard deviation	0.023	1.52	0.055	2.05	0.026	2.13
Personality variable						
Self-efficacy	**0.163***	**0.311*****	0.048	**0.193****	0.025	0.136
Sense of coherence	0.046	**0.252*****	0.126	**0.234****	0.089	**0.159***
Subjective vitality	0.137	**0.377*****	0.084	**0.214****	0.080	**0.237****
Tolerance for ambiguity	0.123	**0.233****	0.074	0.142	0.094	**0.174***
Free will (Freedom/ Determinism Beliefs)	**0.148***	**0.219****	0.083	**0.158***	-0.058	**0.177***
Hardiness	0.093	**0.215****	0.074	**0.233****	0.069	0.112

Only variables with significant correlations are presented in the table. Values in bold letters show significant correlations. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 4 Pearson Correlation coefficients between positive emotions in Situations A, B, C and personality variables

	Positive emotions in Situation A "COVID-19"		Positive emotions in Situation B "Constitution"		Positive emotions in Situation C "Oil prices"	
	Slope (dynamics)	Intercept (mean)	Slope (dynamics)	Intercept (mean)	Slope (dynamics)	Intercept (mean)
Descriptive statistics						
Minimum	-0.150	8.89	-0.040	7.42	-0.080	7.55
Maximum	-0.140	23.3	0.060	21.6	0.020	20.0
Mean	-0.141	15.5	-0.002	12.6	-0.031	12.0
Standard deviation	0.002	2.35	0.014	2.38	0.012	2.31
Personality variable						
Harmony with life (Personal life position)	–0.002	**0.280*****	0.032	**0.173***	–0.039	**0.197****
Agency (Personal life position)	0.095	0.054	0.050	**0.146***	–0.010	**0.205****
Subjective vitality	0.074	**0.343*****	0.076	**0.252*****	0.068	**0.396*****
Tolerance for ambiguity	–0.002	**0.331*****	0.090	**0.234****	0.100	0.142
Self-efficacy	0.044	**0.160***	0.022	**0.167***	–0.028	0.092
Hardiness	–0.034	**0.247*****	–0.014	0.126	0.010	0.141

Only variables with significant correlations are presented in the table. Values in bold letters show significant correlations. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

as well as tolerance for ambiguity and self-efficacy (Situations A and B), agency (Situations B and C), and hardiness (Situation A).

Turning to negative emotions, the intercepts of both active and passive negative emotions showed significant negative correlations with a number of personality variables (Table 5). The general pattern was that individuals with higher levels of harmony with life, hardiness, sense of coherence, tolerance for ambiguity, subjective vitality, and belief in free will tended to experience both active and passive negative emotions in the situations of uncertainty to a lesser extent.

As for the dynamics of negative emotional reactions (Table 6), belief in free will was the only resource variable

Table 5 Pearson Correlation coefficients between negative emotions (intercepts) in Situations A, B, C and personality variables

	Negative emotions in Situation A "COVID-19"		Negative emotions in Situation B "Constitution"		Negative emotions in Situation C "Oil prices"	
	Active	Passive	Active	Passive	Active	Passive
Descriptive statistics						
Minimum	3.82	8.09	3.58	7.50	4.22	8.52
Maximum	11.5	26.4	13.9	21.7	12.5	24.7
Mean	6.58	15.6	8.60	13.4	7.19	15.9
Standard deviation	1.79	3.48	3.12	3.27	2.19	3.49
Personality variable						
Harmony with life (Personal life position)	**–0.232****	**–0.236****	**–0.168***	**–0.218****	**–0.178***	**–0.303*****
Hardiness	**–0.335*****	**–0.428*****	**–0.240****	**–0.266*****	**–0.254*****	**–0.381*****
Sense of coherence	**–0.318*****	**–0.370*****	**–0.186***	**–0.224****	–0.139	**–0.242****
Free will (Freedom/ Determinism Beliefs)	**–0.184***	**–0.179***	–0.094	**–0.165***	–0.122	**–0.191***
Tolerance for ambiguity	**–0.215****	**–0.455*****	–0.142	–0.115	–0.137	**–0.328*****
Subjective vitality	**–0.247*****	**–0.401*****	–0.139	**–0.149***	–0.064	**–0.219****
Self-efficacy	**–0.148***	**–0.266*****	–0.091	–0.112	–0.068	**–0.197****

Only variables with significant correlations are presented in the table. Values in bold letters show significant correlations. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 6 Pearson Correlation coefficients between negative emotions (slopes) in Situations A, B, C and personality variables

	Negative emotions in Situation A "COVID-19"		Negative emotions in Situation B "Constitution"		Negative emotions in Situation C "Oil prices"	
	Active	Passive	Active	Passive	Active	Passive
Descriptive statistics						
Minimum	-0.150	-0.350	0.020	-0.210	-0.120	-0.220
Maximum	0.200	0.130	0.060	0.390	-0.030	-0.090
Mean	0.017	-0.082	0.041	0.070	-0.078	-0.150
Standard deviation	0.047	0.053	0.005	0.069	0.012	0.014
Personality variable						
Free will (Freedom/Determinism Beliefs)	–0.115	**–0.176***	**–0.147***	**–0.151***	**–0.178***	–0.081
Hardiness	–0.088	–0.049	–0.020	**–0.222****	–0.041	–0.117
Subjective vitality	0.026	–0.010	–0.011	**–0.209****	–0.014	–0.135

Only variables with significant correlations are presented in the table. Values in bold letters show significant correlations. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

to show consistent effects across the situations. For Situation A ("COVID-19"), we observed, on average, a decline in negative passive emotions, which was faster in individuals who tended to believe in free will. For Situation B ("Constitution"), both active and passive negative emotions tended to increase, but this was less likely in individuals with a higher belief in free will. Hardiness and subjective vitality were also associated with a slower increase of passive negative emotions. Finally, for Situation C ("Oil prices") negative active emotions were likely to decrease, on average, but this was faster in individuals with higher belief in free will.

Discussion

Daisaku Ikeda, a Buddhist philosopher, once said that a person's true nature is revealed at times of the greatest adversity. In line with this saying, we observed significant individual differences in the appraisals of the three challenging situations and in the changes in these appraisals as these situations developed over time. These challenges were of vastly different nature: the COVID situation was the least certain, but initially appeared easier to adapt to, tending to become more challenging over time as it became apparent that the pandemic would not be over very soon. The constitution affair was overall the most certain but was associated with the strongest negative emotional reactions and eased over time, after the amendments were adopted. Finally, the oil prices crisis was completely uncontrollable, which reflected itself in the lowest orientation scores.

Despite these vast differences, we have observed consistent patterns of association between the personality resource variables and the appraisals of these three uncertain situations. Higher levels of personality resources were associated with higher level and more positive dynamics of certainty, confidence, and positive emotional reactions to the challenging situations, with an inverse pattern for negative emotions. Most of these effects were fairly weak ($r < 0.20$), but all the statistically significant associations that we observed were in the theoretically predicted direction.

High level of self-efficacy, harmony with life, a sense of coherence, subjective vitality and tolerance for ambiguity predicted a higher average assessment of the certainty of the situation, and also "slowed down" the decline in this assessment with a general increase in the uncertainty of the coronavirus situation. The higher the level of belief in freedom, tolerance for ambiguity, subjective vitality, self-efficacy, hardiness, a sense of coherence, the better a person was oriented in situations of uncertainty. With a general drop in the level of orientation, which was natural due to a decrease in the certainty of the pandemic situation, most of these indicators were associated with a slower decline. Personality dispositions also predicted emotional responses in situations of uncertainty. For emotions, they were more strongly and consistently associated with the intercepts, whereas for the cognitive evaluations, they were more likely associated with slopes.

These findings are in line with the theoretical expectations suggesting that personality resources, such as hardiness, sense of coherence, belief in free will, self-efficacy, and tolerance for ambiguity are conducive to successful adaptation to stressors. We believe that this study, although related to a local context, contributes to the body of findings showing an adaptive role of personality resources. The results of the study also support and extend the findings of the research on the importance of an individual's active role in situations of crisis. This active position against uncertainty can be expressed in hope and resilience (Yidirim & Güler, 2021; Yidirim & Arslan, 2020; Nestik, 2020), the internal locus of control (Emelyanova et al., 2020), a belief in one's ability to influence life (Krampe et al., 2021).

The current pandemic situation is not only a global threat; it is unprecedented because of total uncertainty concerning its origins, the current state of affairs, and future prognoses. A suitable response to the challenge of COVID-19 might be the development of existential positive psychology, combining a rigorous academic approach with existential thinking (Wong, 2021). The existentialist foundation of existential positive psychology emphasizes ultimate uncertainty as an inevitable characteristic of the human condition, but its positive foundation focuses on the psychological resources that can make us capable of accepting this challenge of ultimate uncertainty and standing up to it, not only to survive, but to thrive.

Limitations

Obviously, the present study is not without its limitations. A modest sample size allowed us to achieve acceptable statistical power (> 0.80) for medium-sized effects ($r = 0.20$), but not for small effects (power was only 0.52 for $r = 0.15$). The situations were presented to participants in the same order, which could create some bias. Finally, some of the measures of uncertainty appraisals that we devised for the present study had modest reliability, which could also reduce the effect sizes. Nevertheless, we believe that the present study can be considered a pilot showcasing the viability of the approach we have taken, and that replication using larger samples and more diverse social, cultural, and situational contexts, as well as more refined measures, could extend our knowledge about the positive role of personality resources in challenging situations. Additionally, the concept of uncertainty has a wide content spectrum. Even though the situations considered were defined by sociologists and public opinion experts as the most large-scale crises of uncertainty in 2020 in Russia, it is difficult to argue that similar patterns will be found in all situations of uncertainty. Moreover, the description of the situations could act as a framing for the respondents and set a certain attitude related to the perception of these situations as "negative", "uncertain", "having serious consequences". To control the manifestation of such predispositions in the future, one can add to the study design a preliminary focus group to select situations of uncertainty, or a pilot study to collect ideas and emotional reactions to the description of situations, or a control group to evaluate situations without a detailed description. Also, since the situations were presented to the respondents in the same order, it is impossible to exclude the

interfering influence of the perception of one situation on the attitude to subsequent situations.

Since the research was exploratory and opportunistic and the authors followed the unpredictable dynamics of the events, they could not plan and implement any preregistration.

Practical implications

The results of the study contribute to the understanding of the role of personality characteristics as resources for successful adjustment to conditions of uncertainty. The data obtained have important psychotherapeutic potential and can be used in the practice of psychological counseling for working with situations of uncertainty and actualization of personality resources that contribute to the achievement of psychological well-being and inner balance. The results obtained can also be useful in working with personnel to develop educational and training programs for the development of personality resources that play a buffer role in crisis situations, for example in changing conditions within an organizational environment.

Conclusion

The results of the study showed that individual characteristics such as self-efficacy, tolerance for ambiguity, a sense of coherence, subjective vitality, belief in freedom, and hardiness, represent positive personality resources that perform a buffer function when interacting with subjective uncertainty. The data obtained correspond to the ideas of existential and positive psychology, according to which a person is forced to face absolute uncertainty and find ways to resist these challenges. Further research may be aimed at studying coping with uncertainty in other situations as well as with objective uncertainty as a fundamental characteristic of the world.

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Data availability The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

The study was approved by the Commission for Ethical Evaluation of Empirical Research Projects (Protocol № 11 of 10 June 2022), Department of Psychology, Faculty of Social Sciences, HSE.

Consent to participate Informed consent was obtained from all individual participants included in the study.

Competing interests The authors report there are no competing interests to declare.

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