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COVID-19: Belief in Conspiracy Theories and the Need for Quarantine

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Background. Situations that are characterized by unexpected scenarios, unpredictable developments, and risks to life and health facilitate beliefs in conspiracy theories. These beliefs — together with reliable information, intentional and unintentional misinformation and rumors — determine attitudes toward the situations and ways to overcome them.

Objective. To examine the effect of belief in conspiracy theories on the recognition of the need for quarantine during the COVID-19 pandemic; the effect of personality traits on belief in conspiracy theories and on the recognition of the need for quarantine; the relationship of belief in conspiracy theories with assessment of the dangers of COVID-19 and with feelings of hopelessness.

Design. The study was conducted over a period when the number of coronavirus cases was growing, during the first three weeks of the lockdown in Russia. The sample included 667 undergraduate and graduate students aged 16–31 ($M = 20.44$, $SD = 2.38$); 74.2% of the participants were women. Respondents filled out two online questionnaires. The first related to perceptions about the COVID-19 pandemic; the second was a brief HEXACO inventory.

Results. Belief in Conspiracy Theories accounts for 13% of variance in Recognition of the Need for Quarantine; together with Dangers of COVID-19 and Hopelessness, conspiracy beliefs account for more than a quarter of the variance. Personality traits defined in the context of the 6-factor personality model have a small effect on conspiracy beliefs about the coronavirus and on perception of the need for quarantine.

Conclusion. Belief in conspiracy theories is associated not only with irrational views of reality, but also with the adoption of ineffective behaviors.

Introduction

Conspiracy theories are viewed as attempts to explain various social phenomena as the result of conspiracies by certain powerful groups that are exceptionally effective and no less exceptionally malicious (Douglas & Sutton, 2018). It is assumed (van Prooijen & van Vugt, 2018) that conspiracy theories are always based on a perceived causal relationship between events, a conviction that certain people act deliberately to carry out their secret plans, and a certainty that there exists a group of people who work together to develop their conspiratorial plans and to bring them to life. In addition, conspiracies always presume elements of danger and secrecy.

Conspiracy beliefs are fueled by a deficit of information and/or a lack of ability to obtain reliable information, which happens all the time, particularly in extraordinary circumstances: Information is often contradictory or may be deliberately obscured or too difficult to comprehend (Sunstein & Vermeule, 2009). The lack of information gives rise to another source of conspiracy theories: uncertainty. Changes in the familiar context of events, uncertainty about how a situation will develop, helplessness — all of this requires a quick response. Even though conspiracy theories are related to the oversimplification of a problem and the distortion of information, in a complex situation they serve an adaptive function: They quickly provide an explanation for confusing and threatening events. This creates the illusion of control over the situation, maintains self-esteem, reduces anxiety, and can restore (albeit not always) a level of activity that makes it possible to deal with problems (Hofstadter, 1966). At the same time, the accessibility and reliability of information and certainty about a situation do not guarantee that conspiracy theories will not emerge.

Three mutually related approaches to studying conspiracy theories and their origins can be highlighted in psychology: (a) analyzing conspiracy theories as a manifestation of psychopathology, (b) identifying personality traits and cognitive characteristics that can increase a predisposition to conspiracy beliefs, and (c) looking at the determinants of conspiracy theories from the point of view of social psychology.

(a) A manifestation of psychopathology. From the earliest research into conspiracy theories (Hofstadter, 1966), it was posited that they were associated with a tendency toward paranoid ideation. Empirical studies with a normal population confirmed the hypothesized relationship with paranoid ideation and demonstrated an association with schizotypy. Thus, conspiracies were shown to be associated with paranoid ideation, delusion-proneness, and schizotypy (Barron, Morgan, Towell, Altemeyer, & Swami, 2014; Brotherton & Eser, 2015; Bruder, Haffke, Neave, Nouripanah, & Imhoff, 2013; Darwin, Neave, & Holmes, 2011; Georgiou, Delfabbro, & Balzan, 2019; Hart & Graeter, 2018). Comparative analysis of two groups — conspiracist website visitors and students who agreed to participate in the study — demonstrated more pronounced conspiracy theories for the group of conspiracist website visitors. No differences were found in schizotypy between the groups; however, respondents with the highest schizotypy scores had much higher levels of conspiracy mentality (van der Tempel & Alcock, 2015). An investigation of conspiracy beliefs and the influence of maladaptive traits (25 PID-5 facets) on conspiracy beliefs showed that two facets — Suspiciousness and, to a greater de-

gree, Unusual Beliefs and Experiences — were significant predictors of conspiracy theories (Swami, Weis, Lay, Barron, & Furnham, 2016b).

The only study that compared emotional problems and conspiracy theories about the origin of COVID-19 showed a correlation between emotional problems and supernatural beliefs about the origin of the coronavirus (Somma et al., 2020).

(b) Research into the personality correlates of belief in conspiracy theories began in the 1990s and already then showed that conspiracy beliefs are associated with low levels of trust and high levels of anomie (Goertzel, 1994). Low levels of trust together with an external locus of control and hostility are also associated with perceptions of the existence of conspiracies (Abalakina-Paap, Stephan, Craig, & Gregory, 1999) and with low trust in government services and institutions (Einstein & Glick, 2015). The link with anomie was confirmed later (e.g., Bruder et al., 2013).

Stronger conspiracy beliefs are associated with higher levels of powerlessness (Abalakina-Paap et al., 1999; Bruder et al., 2013; Jolley & Douglas, 2014) and lower levels of control (van Prooijen & Acker, 2015). Correlations were found between conspiracy theories and authoritarianism (Abalakina-Paap et al., 1999; Bruder et al., 2013; Wood & Gray, 2019), personal efficacy (Bruder et al., 2013), and belief in a dangerous world (Hart & Graeter, 2018).

In studying predictors of conspiracy beliefs, it would be logical to suppose that the most basic personality traits (Big Five) create a predisposition for conspiracy beliefs. Some confirmation of this supposition was found (Bruder et al., 2013; Swami et al., 2011; Swami & Furnham, 2012). However, the results of a meta-analysis based on random-effects models were disappointing: None of the Big Five traits exhibited a correlation with conspiracy theories if effect sizes were aggregated (Goreis & Voracek, 2019).

Since conspiracy theories become particularly popular in crisis situations, research into emotional states — fear, anxiety, stress — can play a special role in personality research into conspiracy theories. For example, it has been demonstrated that higher anxiety results in reduced analytic thinking and thus lower critical thinking about conspiracy theories (Swami, Voracek, Stieger, Tran, & Furnham, 2014). At the same time, data on anxiety are mixed: Pre-exam anxiety was shown to be related to conspiracy theories (Grzesiak-Feldman, 2013), while assessments of actual anxiety and anxiety as a personality trait were not (Swami et al., 2016a). The subjective assessment of perceived stress and stressful life events were significant predictors of conspiracy theories, accounting for a small part of their variance (Swami et al., 2016a).

Two studies conducted during the COVID-19 pandemic (Georgiou, Delfabbro, & Balzan, 2020, in press; Jovanchevic & Milićević, 2020, in press) had results that corresponded to those obtained in calmer times. Thus, conspiracy theories related to the coronavirus turned out to be closely related to other conspiracy theories, but did not show links with perceived stress, even though these associations were expected to be closer than in calmer times. The authors of the first study posit that the results may reflect the fact that a large part of the sample was in self-isolation and felt safe, experiencing boredom rather than stress (Georgiou et al., 2020, in press). The second study used one item to assess belief in conspiracy theories: "The virus was created in the laboratory on purpose." This item was associated with "trust," but only in one of the two samples of the study (Jovanchevic & Milićević, 2020, in press).

Cognitive characteristics have been investigated in only a few studies. Their results showed a correlation between conspiracy theories and low intelligence, relatively low levels of education, errors in assessing the probability of events, low analytical thinking, high need for cognitive closure, and well-developed intuition (for example, Georgiou et al., 2019; Leman & Cinnirella, 2013; Marchlewska, Cichocka, & Kossowska, 2017; Swami et al., 2014; van Prooijen, 2017).

Personality trait studies have served an important role in conceptualizing conspiracy beliefs.

First of all, these studies have brought the subject of conspiracy theories beyond the discourse of pathology — latent psychopathology, to use the terminology of Swami et al. (2011) — positing that normal personality traits serve as the antecedents of conspiracy beliefs.

Second, studies of very different conspiracy theories have shown that there are significant correlations between them. If a respondent believes in one conspiracy theory, he or she is much more likely to believe in others, even if some of them contradict each other (Goertzel, 1994; Swami et al., 2011). This made it possible to talk about separating out a constellation of conspiracy theories (conspiracist ideation) and also demonstrated that conspiracy theories are "monological" — i.e., attitudes toward new events are regulated by the way in which they fit in with pre-existing conspiracy theories. Nevertheless, there are cases when conspiracy beliefs lead to different, even opposite, behaviors (Imhoff & Lamberty, 2020).

(c) Social-psychological studies of conspiracy theories have only been conducted for several years. They actively assimilate the factology of other research directions, introduce new subject matter related to social cognition and motivation, and look at conspiracy theories as a result of everyday cognitive processes (Douglass, Sutton, & Cichocka, 2017; Douglas & Sutton, 2018).

A key objective of social-psychological studies is to understand what purpose conspiracy theories serve, what motivations they satisfy for those who believe in them, and what advantages and disadvantages they offer. To that end, it is useful to consider the motivations of conspiracy theories in the context of a classification borrowed from system-justification theory (Jolley, Douglas, & Sutton, 2018; Jost, Ledgerwood, & Hardin, 2008). This classification includes three perspectives for analysis: epistemic (understanding a situation enough to feel confident), existential (being able to control a situation and feel safe), and social (maintaining one's image in a group) (Douglas et al., 2017).

Social-psychological studies showcase indicators that are typical of conspiracy theories (Hofstadter, 1966): Simplification and rationalization of reality and the tendency to attribute complex and multifaceted phenomena of social life to the machinations of enemies (Lamberty, Hellmann, & Oeberst, 2018; Pellegrini, Leone, & Giacomantonio, 2019; Sutton & Douglas, 2020). Belief in conspiracy theories emerges when the authorities have low moral authority, particularly under conditions of uncertainty (van Prooijen & Jostmann 2013).

In closing this brief overview, we should highlight a key aspect of conspiracy theory research. All discussions to date have been based on the hypothesis that conspiracy theories are rooted in erroneous premises that served as the foundation for mistaken conclusions. However, the belief that the mighty of the world are involved in a conspiracy could be quite reasonable. A textbook example of this was

Watergate. In this case, being suspicious had nothing to do with schizotypy, and belief in a conspiracy had a proactive rather than defensive nature. Many researchers have insisted on the need to distinguish between the two versions of being suspicious, particularly the researchers who analyzed conspiracy theories from the viewpoint of philosophical epistemology rather than psychology — unfortunately, not now, but in earlier studies (Bale, 2007).

Psychological studies of conspiracy theories recognize that conspiracy theories play a defensive, if not adaptive, role, and they concur that the key situational sources of conspiracy theories are uncertainty, lack of clarity, and danger. This is the very situation created by the COVID-19 pandemic.

The evolution of the pandemic in Russia throughout March 2020 set the stage for recognizing that the country had not escaped the fate that had befallen many other countries close by and far away. While in early March Russian officials had declared that measures taken by the authorities were primarily preventative, by the middle of March the tightening of the measures clearly showed that preventative measures were not sufficient, and that quarantine measures would soon be introduced. In early March there was a proposal to switch schools to distance learning if possible; on March 14, a decree was issued requiring all schools to transition to distance learning; and on March 21, universities were ordered to switch to distance learning. On March 16, events with more than 5,000 participants were prohibited in Moscow; six days later, the permitted number of participants was reduced to 50. On March 27, a public holiday (a soft form of self-isolation) through April 2 was declared in order to slow the spread of the coronavirus; by March 30, the self-isolation was extended to April 12 in Moscow and 31 other regions; on April 2, the self-isolation was extended nationwide until April 30.

All of these measures created an atmosphere that made the emergence of conspiracy beliefs about the coronavirus not just possible, but inevitable. From the very beginning of the pandemic, before any cases of infection were reported in Russia, there were already conspiracy theories circulating online. As cases of COVID-19 appeared and their number increased, at least half of the discussions on the Internet about newspaper articles and radio or TV performances that related at least indirectly to the coronavirus contained various and frequently contradictory conspiracy theories. One of the most popular blames Bill Gates for the pandemic, claiming that it is an excuse to create a vaccine and implant microchips into people along with the vaccine. There are different versions of the theory that offer varying reasons why Bill Gates would want this — for example, to reduce the world population, to gain unlimited access to information about everyone, or to rule all of humanity.

The very fact of the pandemic also sparks mistrust. According to a sociological survey conducted by the Higher School of Economics (Artamonov, 2020), the number of respondents who believe that "there is no and will be no epidemic; it is just a fabrication by interested parties" increased from 11.6% on March 19 to 20.7% on May 12. This is despite the fact that the number of coronavirus infections also increased during this period, from 199 to about 232,000.

Our study investigated whether belief in conspiracy theories affects recognition of the need for quarantine; the association of conspiracy beliefs with assessment of

the danger of COVID-19 and with hopelessness; and the links between conspiracy beliefs and personality traits. The hypotheses of the study were as follows:

H1: Respondents who believe in conspiracy theories deny the danger of COVID-19 and do not support the introduction of quarantine measures.

H2: The associations between conspiracy beliefs and hopelessness are positive. We expect that inability to influence a situation and doubts that infection can be avoided lead to conspiracy beliefs and to denial of the danger of COVID-19.

H3: In the uncertain and unpredictable situation resulting from the COVID-19 pandemic, HEXACO personality traits may serve as predictors of conspiracy beliefs and recognition of the need for quarantine.

Methods

Procedure

The study was conducted online with a sample of undergraduate and graduate students. Professors involved in distance education shared information about the study and forwarded a request from the study organizers to their students. Participants received a link to a website with the questionnaires. The students could choose whether to provide their names or use nicknames. Those who wanted to receive feedback could include their email addresses. Thus, the study was voluntary, and the participants could choose whether it was anonymous.

The data analyzed in this article were collected between March 31 and April 23, 2020. During that time, the number of coronavirus cases in Russia rose from 2,337 to 62,773. The number of infections in the regions where the study participants resided rose from 1,740 to 37,939. *Figure 1* shows the curve of confirmed cases from the date when lockdown measures were introduced in Russia and until their gradual lifting began. The period during which data were collected is also marked on the graph.
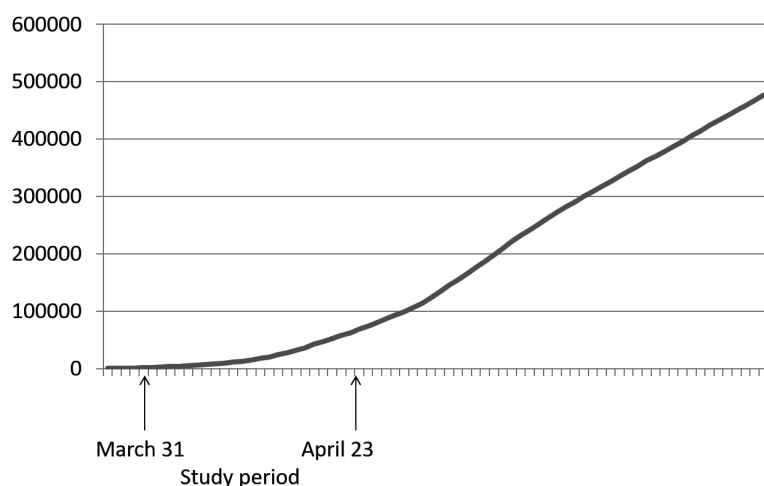
Figure 1. Number of those infected during the lockdown (March 26 — June 7) and during the study period (March 31 — April 23).

The study was completed long before coronavirus infections in Russia peaked. Thus, respondents who filled out questionnaires at the beginning of the study and those who did so at the end were in a similar situation: They were hoping that the rate of infections would soon start slowing, and they were making forecasts based on dynamics in other countries where COVID-19 began to spread a month or two earlier than in Russia. Although the forecasts were not optimistic, depression and demoralization did not stand out as major problems during the period — at least not for students. Naturally, restrictions on social interactions and movement stemming from the quarantine measures had an impact on their moods, but the participants in our sample continued to live a relatively normal life: All of them were still studying (distance learning), and many expected to make good use of the free time they would gain because of the involuntary isolation.

Participants

The sample included 667 participants aged 16–31. The mean age was 20.44 (standard deviation of 2.38). All participants were college students (undergraduate and graduate) with different majors, including mathematics, physics, biology, medicine, psychology, jurisprudence, sociology, philology, and journalism. The ratio of women to men was 74.2% to 25.8%. The prevalence of women in our sample is typical for online surveys.

The participants' regions of residence included Moscow and Moscow District, St. Petersburg, Nizhny Novgorod, Krasnodar Krai, and a number of cities in the Volga region (total of 15 locations). Four of these cities have had the highest rates of infection in the country throughout the pandemic.

Measures

COVID-19 Questionnaire

The respondents' perceptions of the dangers of COVID-19 and the social situation resulting from the spread of the coronavirus were assessed using a 22-item questionnaire developed by the authors. When designing the questionnaire, we posited that some of the items would form four scales: Danger, Belief in Conspiracy Theories, Recognition of the Need for Quarantine, and Hopelessness. When the items were factorized (principal component factor analysis, Varimax rotation), this hypothesis was confirmed. In addition to these four scales, items were selected based on a factor obtained through a single-factor solution to comprise a fifth scale: Denial of Danger (Egorova, Parshikova, Zyryanova, & Staroverov, in press).

The Conspiracy Beliefs scale includes 4 items, such as "*There is no pandemic, we are being deceived by those who profit from creating panic and bringing down the world economy*." According to expert analysis, the scale is associated with a tendency to seek out enemies who either greatly exaggerate the dangers of the coronavirus or have completely fabricated the pandemic due to some ulterior motives. The factor associated with conspiracy beliefs accounts for 14% of variance. The internal consistency of the scale (Cronbach's alpha) is 0.72.

The Danger of COVID-19 scale includes 3 items, such as "*I think that the coronavirus really is very dangerous*." Expert analysis associates the scale with the un-

derstanding of the contagiousness of the SARS-CoV-2 virus, the severe forms of the disease, and the high death rate. The factor associated with the Danger of CO-VID-19 accounts for 13% of variance. The internal consistency of the scale (Cronbach's alpha) is 0.73.

The Recognition of the Need for Quarantine scale includes 3 items, such as "*I view the introduction of strict quarantine measures to prevent the spread of the coronavirus as completely justified.*" The factor associated with Recognition of the Need for Quarantine accounts for 12% of variance. The internal consistency of the scale (Cronbach's alpha) is 0.57.

The Hopelessness scale includes 3 items, such as "*Almost everyone will become infected and get sick, it is only a matter of time.*" According to expert analysis, Hopelessness reflects a sense of helplessness and the conviction that efforts aimed at reducing the risk of infection are pointless. A good example of hopelessness is a phrase that became popular at the beginning of the pandemic, the original author of which is not known: "We thought this was a planet of people, but it's a planet of viruses." The factor associated with Hopelessness accounts for 8% of variance. The internal consistency of the scale (Cronbach's alpha) is 0.42.

The Denial of danger scale includes all items from the questionnaire that had factor loadings of over 0.5 in a single-factor solution downplaying the dangers of the coronavirus ("*It is no worse than the flu*"), denying the existence of the pandemic, unwillingness to recognize the need for preventative measures, and highlighting their negative consequences ("*The economic consequences of quarantine are more dangerous than the coronavirus*"). The internal consistency of the 10-item scale is 0.78.

Two other items from the questionnaire, which are not included in the scales, are used in describing the results: "*No one knows the real number of coronavirus cases in Russia, because we do not have large-scale testing of the population*" and "*Our country is better prepared than other countries to fight the epidemic.*"

When filling out the questionnaire, respondents rated their agreement-disagreement with its statements on a 5-point Likert scale.

Brief HEXACO Inventory

A short version of the Russian adaptation of the HEXACO-PI-R inventory (Egorova, Parshikova, & Mitina, 2019) was used to assess personality traits. The inventory has 24 items, 4 for each personality trait, and makes it possible to assess 6 factor-level traits.

Honesty/Humility — high scores reflect candidness, reluctance to stand out by demonstrating one's status or material advantages, distaste for deceit regardless of the chances of being caught, and disinclination to manipulate others or act falsely for personal gain.

Emotionality — manifested as a tendency to worry with or without reason, to fear injury and illness, to seek support from others, and to express empathy toward others.

Extraversion — high scores are associated with sociability, energy, high self-esteem, and ability to influence others.

Agreeableness — readiness to understand others and pay attention to their opinions. Individuals with high Agreeableness scores are rarely irritated and angered by others, forgive offenses easily, and are not prone to criticize or harshly judge those around them.

Conscientiousness — exhibited as diligence, a desire for order, caution and forethought in making decisions, and the ability to work hard to achieve one's goals.

Openness to Experience — high scores are associated with curiosity, a good imagination, a love of the arts and literature, interest in all things unusual, and creativity.

Respondents rated their agreement-disagreement with the statements of the inventory on a 5-point Likert scale.

Social and Demographic Characteristics

When filling out the questionnaires, respondents provided their age, gender, birth order, current region of residence, educational institution, and field of study.

Results

Descriptive Statistics and Correlation of Conspiracy Belief Indicators

Descriptive statistics for items related to belief in conspiracy theories and for the five questionnaire scales are presented in *Table 1*. Average responses for the four items of the questionnaire related to a conspiratorial view of the coronavirus are skewed toward the negative side (i.e., the majority of participants are skeptical about conspiracy theories). Significant gender differences were identified for only one scale: Recognition of the Need for Quarantine. Women were more likely to support the use of quarantine measures.

All items from the Belief in Conspiracy Theories scale have a negative correlation with the Danger of COVID-19 scale and the Recognition of the Need for Quarantine scale, which is reasonable: A quarantine does not make sense if the coronavirus is no more dangerous than the flu or if it's just someone's malicious fabrication. The Hopelessness scale has a positive correlation with the Belief in Conspiracy Theories scale, which does not seem logical, at least at first glance: Why would respondents agree that "almost everyone will get infected and get sick" if they do not consider the coronavirus dangerous?

The Hopelessness scale is associated with not feeling sufficiently informed. This is evidenced by the positive correlation between the scale and the questionnaire item that states *"No one knows the real number of coronavirus cases in Russia, because we do not have large-scale testing of the population"* ($r = .13$, $p = .001$), whereas the Belief in Conspiracy Theories scale has correlations with insufficient information ($r = .11$, $p = .003$) and a negative association with lack of trust in the readiness of government institutions to combat the COVID-19 epidemic (*"Our country is better prepared than other countries to fight the epidemic"* ($r = -.11$, $p = .004$)).

Table 1

Means, standard deviations, gender differences, and correlation (Spearman's rho)

Items of the scale Belief in Conspiracy Theories and all scales	M (SD)			t f vs m	Items of the scale Belief in Conspiracy Theories			
	All	Female	Male		1	2	3	4
Items								
1. The hysteria surrounding the coronavirus is being fueled to distract attention from other national problems.	2.88 (1.38)	2.94 (1.36)	2.73 (1.42)	ns	1.00	.39**	.26**	.43**
2. There is no pandemic; we are being deceived by those who profit from creating panic and bringing down the world economy.	1.49 (0.90)	1.53 (0.90)	1.38 (0.92)	ns		1.00	.50**	.37**
3. The new virus is a conspiracy by pharmaceutical companies that want to make money on it.	1.26 (0.61)	1.25 (0.57)	1.27 (0.73)	ns			1.00	.28**
4. The authorities are using the pandemic to isolate the country and restrict the rights and freedoms of its citizens.	2.06 (1.26)	2.02 (1.24)	2.19 (1.34)	ns				1.00
Scales								
Belief in Conspiracy Theories	1.92 (0.78)	1.93 (0.75)	1.89 (0.85)	ns	.84**	.62**	.49**	.77**
Danger of COVID-19	3.50 (0.99)	3.67 (0.97)	3.57 (1.03)	ns	–.45**	–.42**	–.21**	–.27**
Denial of Danger	2.32 (0.75)	2.20 (0.73)	2.29 (0.82)	ns	.76**	.59**	.41**	.61**
Need for Quarantine	3.74 (0.85)	3,67 (0.83)	3.60 (0.91)	2.41*	–.27**	–.21**	–.06	–.28**
Hopelessness	2.81 (0.87)	2.67 (0.87)	2.78 (0.88)	ns	.31**	.22**	.11**	.24**

*Note. N = 667, * p < .01, ** p < .001*

Belief in Conspiracy Theories and Personality Traits

The personality traits examined in relation to belief in conspiracy theories included the factor-level traits of the 6-factor HEXACO model of personality: Honesty/Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience.

Mean Differences. Responses to items related to belief in conspiracy theories that fell in the middle range of values were excluded. The mean values for personality traits were calculated for participants who received high and low scores

on the Belief in Conspiracy Theories scale (i.e., those in the outermost groups), and the differences in means of personality traits were assessed (*Table 2*). Since the suitability of the parametric criterion for comparing extreme groups can be called into question, the differences of means were compared using not only Student's *t*-criterion but also the non-parametric Mann-Whitney Z criterion. When using parametric and non-parametric criteria, the differences of means fully coincided: Significant differences were identified between the same personality traits.

Table 2

Personality traits with significant differences in outermost groups
(high-low Belief in Conspiracy Theories)

Belief in Conspiracy Theories	Personality Traits	Responses*		t-criterion	Mann–Whitney Z
		Yes	No		
1. The hysteria surround-ing the coronavirus is being fueled to distract attention from other national problems.	Honesty/ Humility	3.33	3.51	–2.51, p = 012	–2.380 p = .017
	Extraversion	3.11	2.84	3.28, p = .001	–3.294 p = .001
2. There is no pandemic; we are being deceived by those who profit from creating panic and bringing down the world economy.	Honesty/ Humility	2.86	3.46	–4.18, p = .000	–3.477 p = .001
3. The new virus is a con-spiracy by pharmaceuti-cal companies that want to make money on it.	Honesty/ Humility	2.08	3.45	–5.35, p = .000	–4.110 p = .000
	Emotionality	2.83	3.59	–2.91, p = .004	–2.230 p = .026
	Openness to Experience	3.10	3.86	–2.96, p = .003	–2.820 p = .005
4. The authorities are using the pandemic to isolate the country and restrict the rights and freedoms of its citizens.	Honesty/ Humility	3.22	3.47	–2.67, p = .008	–2.443 p = .015
	Conscien-tiousness	3.25	3.51	–2.92, p = .004	–2.839 p = .005
Overall Scale	Honesty/ Humility	2.96	3.48	–4.43, p = .000	–3.697 p = .000

Note. *Means of personality traits for respondents who did and did not agree with this item of the ques-tionnaire.*

The results indicate, first of all, that Honesty/Humility plays a special role (there are differences related to this personality trait both for the overall scale and for all items of the scale), and, second, that all six personality traits are involved to some degree. Belief in conspiracy theories is exhibited most frequently by those with higher Extraversion scores and lower scores for all other personality traits.

Correlation Analysis. All items from the Belief in Conspiracy Theories scale exhibit low but significant negative correlations with Honesty/Humility, and three of the four exhibit positive correlations with Extraversion. The value of the correlations is not above .15. The Belief in Conspiracy Theories scale has significant correlations with Honesty/Humility ($r = -.11$, $p < .01$) and Extraversion ($r = .09$, $p < .03$).

Regression Analysis. Multiple regressions were conducted to determine the effect of personality traits on conspiracy beliefs and related attitudes toward COVID-19. In all cases, the predictors were the personality traits and the dependent variables were (a) Belief in Conspiracy Theories, (b) Denial of Danger, (c) Hopelessness, and (d) Recognition of the Need for Quarantine. All models were significant ($p < .001$).

a) Personality traits predicted 3.1% of variance in the Belief in Conspiracy Theories and the only significant predictor was Honesty/Humility ($b = -.16$, $p < .001$): The higher the Honesty/Humility, the lower the Belief in Conspiracy Theories.

b) Significant predictors of the Denial of Danger were Honesty/Humility ($b = -.14$, $p < .001$) and Extraversion ($b = .10$, $p < .01$; all personality traits together accounted for 3.6% of variance.

c) Personality traits account for 2.8% of variance in the Hopelessness scale. There are significant correlations between Hopelessness and two personality traits — Agreeableness ($b = -.09$, $p < .02$) and Conscientiousness ($b = -.11$, $p < .001$): The lower the Agreeableness and Conscientiousness scores, the greater the sense of helplessness and vulnerability evoked by the pandemic.

d) Individual differences in personality traits are even less closely associated with attitudes toward the introduction of quarantine; these accounted for 2.0% of variance. Significant predictors of Recognition of the Need for Quarantine were Emotionality ($b = .13$, $p < .002$) and Conscientiousness ($b = .11$, $p < .008$): The higher the scores for these traits, the greater the support for quarantine measures.

Mediation Analysis. The Danger of COVID-19 scale was used as the independent variable in the mediation analysis. Its direct and indirect effects on Belief in Conspiracy Theories were assessed. The correlation of the Danger of COVID-19 scale and the Belief in Conspiracy Theories scale is equal to $-.41$, $p < 0.001$. The correlations of the Danger of COVID-19 scale and four items of Belief in Conspiracy Theories are presented in Table 1 ($rs = -.21 — -.45$, $p < .001$). Honesty/Humility was the mediator in analysis of the relations between the scales.

The results obtained are presented in *Figure 2*. Data show that for the Belief in Conspiracy Theories scale (model d) and for three of the four items of the scale (models a–c) the effect of the perception of the Danger of the Coronavirus on Belief in Conspiracy Theories is mediated by Honesty/Humility. All of the models were precisely determined and therefore the chi-square for each model is equal to zero. All coefficients and mediated effects are statistically significant ($p < 0.05$), but the effect sizes are negligible in all cases.
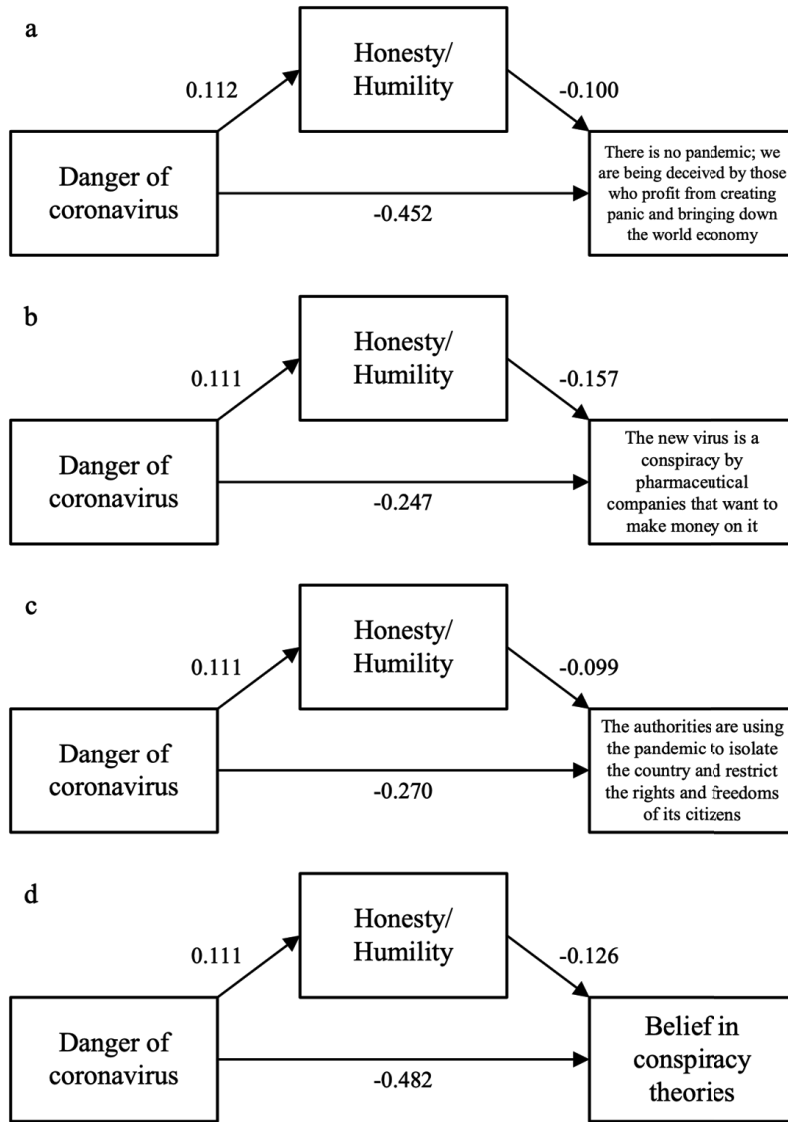
Figure 2. Mediation analysis for the effect of Danger of COVID-19 on Belief in Conspiracy Theories

Moderation Analysis. The aim of the analysis was to determine whether the relationship between Danger of COVID-19 and Belief in Conspiracy Theories depends on the value of Honesty/Humility. The results obtained are presented in *Table 3* and *Figure 3*. The significant differences in the slopes for those who have a high and low level of Honesty/Humility shows that this personality trait moderates the relationship between Danger of COVID-19 and Belief in Conspiracy Theories. Honesty/Humility does not change the direction of the relationship between the perception of danger and conspiracy beliefs, but reduces the perception of the danger of COVID-19.

The new virus is a conspiracy by pharmaceutical companies

There is no pandemic; we are being deceived

Belief in conspiracy theories

Figure 3. Relationship between the perception of the Danger of COVID-19 and Belief in Conspiracy Theories according to the value of Honesty/Humility

Table 3

Results of the moderation analysis

	There is no pandemic…		Conspiracy by pharmaceutical companies…		Belief in Conspiracy Theories Scale	
	b	Sign.	b	Sign.	b	Sign.
Intercept	−.01	.79	−.03	.39	−.01	.80
Predictor (Danger)	−.44	.000	−.22	.000	−.48	.000
Moderator (Honesty/Humility)	−.09	.011	−.14	.000	−.12	.001
Predictor * Moderator	.09	.005	.16	.000	.05	.095
Simple slope Low	−.54	.000	−.37	.000	−.54	.000
Simple slope High	−.35	.000	−.06	.241	−.43	.000
Intercept Low	.08	.103	.11	.040	.11	.021
Intercept High	−.10	.046	−.17	.001	−.13	.010
Sign. intercept differences	.011		.000		.001	
R squared	.23		.13		.27	

Thus, when comparing the outermost groups of Belief in Conspiracy Theories, significant differences were found for personality traits, most often for the Honesty/Humility factor. This factor was also the only significant predictor of Belief in Conspiracy Theories in regression analysis and moderated the relations between the estimate of danger and conspiracy beliefs; however, the contribution of personality traits to variance in Belief in Conspiracy Theories was only equal to 3.1%, while the role of Honesty/Humility as a mediator in the effect of the Danger of COVID-19 on Belief in Conspiracy Theories is very small.
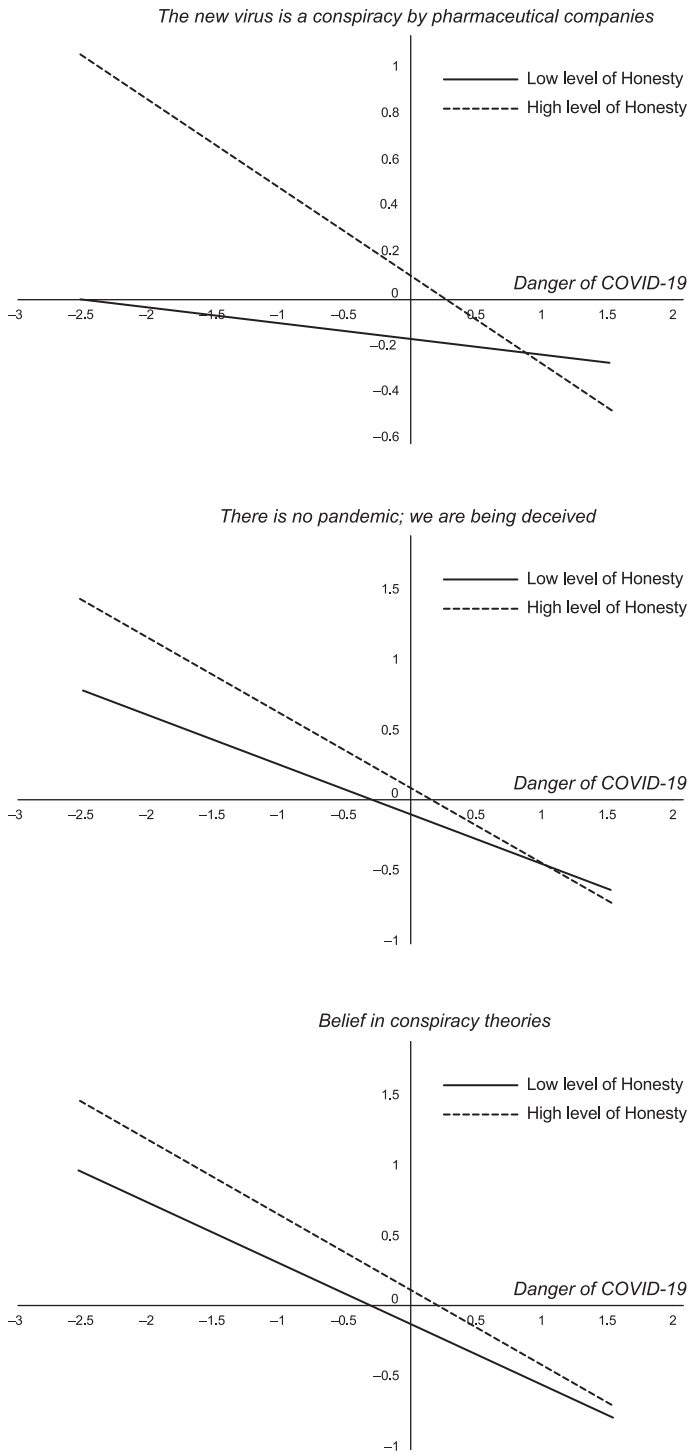
Belief in Conspiracy Theories and Its Relation to Recognition of the Need for Quarantine

When comparing the scales of the questionnaire, the authors considered first of all the extent to which individual differences in conspiracy beliefs are predicted by perceptions of the danger of the coronavirus and the feeling of helplessness in the face of the growing threat of COVID-19 and, second, the extent to which conspiracy beliefs and other indicators of the questionnaire predict unwillingness to recognize the need for quarantine.

The scales of the questionnaire that were later used in regression analysis include Belief in Conspiracy Theories, Danger of COVID-19, Denial of Danger, Recognition of the Need for Quarantine, and Hopelessness. All of the scales have significant correlations (*Table 4*).

Hierarchical linear regression was conducted to determine the effect of the perception of the Dangers of COVID-19 and Hopelessness on Belief in Conspiracy Theories. Demographic characteristics such as age and gender, as well as the date when the questionnaire was filled out, were considered as predictors in the first step. The scales of the questionnaire were included in the second step.

Table 4

Correlations between inventory scales

Scale	1	2	3	4	5
1. Belief in Conspiracy Theories	a =.72	-46**	.85**	-.32**	.32**
2. Danger of COVID-19		a =.73**	-.77**	.44**	-.36 **
3. Denial of Danger			a =.78	-.42**	.50**
4. Recognition of the Need for Quarantine				a =.59	-.28**
5. Hopelessness					a =.43

*Note. N = 667. * p < .01, ** p < .001*

Social and demographic characteristics did not exhibit a relation to beliefs. Both of the scales that were included in the second step were shown to be significant predictors of Belief in Conspiracy Theories: Danger of COVID-19 (b = -.43, $p < .001$) and Hopelessness (b = .18, $p < .001$). The model accounts for 28% of variance, and all variance inflation factors were <1.20.

Mediation analysis that examined the effect of the Danger of COVID-19 on Recognition of the Need for Quarantine (*Figure 4*) exhibited a mediating effect of Belief in Conspiracy Theories. The model is just identified, so the chi-square in the model is zero. All coefficients and mediated effects are statistically significant ($p < 0.05$); however, mediation is proximal, which reduces the effect size.
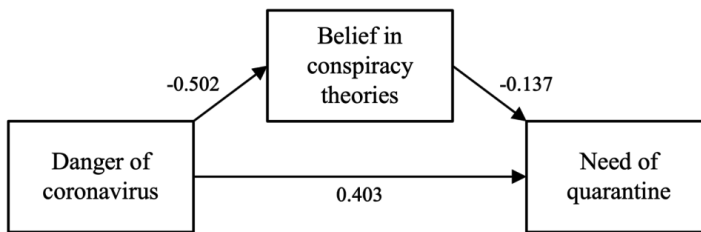
Figure 4. Mediation analysis for the effect of Danger of COVID-19 on Recognition of the Need for Quarantine

Hierarchical linear regressions were also conducted to determine the effect of the predictors of Recognition of the Need for Quarantine. The same parameters were included in the first step: gender, age, and date (*Table 5*). In all cases, the date when the questionnaire was filled out was a significant predictor of attitudes toward quarantine. One scale from the questionnaire was added to each of the three models in the second step: Belief in Conspiracy Theories (regression 1, b = — .34, $p < .001$, adj. $R^2 = 0.13$, $\Delta R^2 = 0.11$), Denial of Danger (regression 2, b = — .36, $p < .001$, adj. $R^2 = 0.15$, $\Delta R^2 = 0.13$), and Hopelessness (regression 3, b = .33, $p < .001$, adj. $R^2 = 0.13$, $\Delta R^2 = 0.11$).

In the fourth regression (regression 4, adj. $R^2 = 0.27$, $\Delta R^2 = 0.25$), all three scales were added in the second step: Belief in Conspiracy Theories (b = −.11, $p < .001$), Danger (b = .38, $p < .001$), and Hopelessness (b = −.12, $p < .001$).

Table 5

Hierarchical linear regression: dependent variable: Recognition of the Need for Quarantine

Predictors	Regression 1	Regression 2	Regression 3	Regression 4
1.(Intercept)				
Gender	–.07	–.07	–.07	–.070
Age	–.06	–.06	–.06	–.055
Date	–.14*	–.14**	–.142	–.14**
2. (Intercept)				
Gender	–.08	–.10*	–.08	–.09*
Age	–.05	–.07	–.04	–.05
Date	–.12*	–.14**	–.13	–.13**
Conspiracy Beliefs	–.34**	–	–	–.11**
Danger of COVID-19	–	–	–	.38**
Denial of Danger	–	–.36**	–	–
Hopelessness	–	–	–.31	–.12**
Adj.R^2	0.13	0.15	0.12	0.27
Change R^2	0.11	0.13	0.10	0.25

*Note. N = 667, * p < .01, ** p < .001*

Thus, the date when the questionnaire was filled out accounted for a small percent of regression variance: The later the date, the more negative the attitude toward the introduction of quarantine. Each of the other predictors of Recognition of the Need for Quarantine accounted for 11–13% of variance, and their joint effect when controlling for gender, age, and date was 27%. The higher the perception of the danger of COVID-19, the more support was expressed for the introduction of quarantine. The higher the belief in conspiracy theories and hopelessness, the more negative the attitude toward the introduction of quarantine. All models were significant in the first and second steps. Even though the scales of the questionnaire correlate with each other, multicollinearity does not appear to have a significant effect on individual predictors: Variance inflation factors in all models were <1.45.

Figure 5. Mediation analysis for the effect of Hopelessness on Danger of COVID-19

The result obtained in the regression analysis suggested an indirect effect between Hopelessness and Danger; mediation analysis (*Figure 5*) exhibited a mediating effect of Belief in Conspiracy Theories. The model is just identified, so the chi-square in the model is zero. All coefficients and mediated effects are statistically significant ($p < 0.05$).
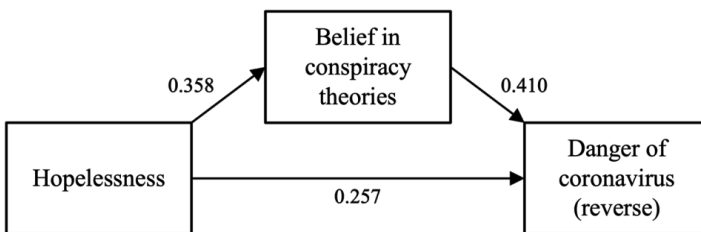
Discussion

The first hypothesis of the study addressed the relation of conspiracy beliefs to the assessment of the danger of COVID-19 and the recognition of the need for quarantine. The results confirmed the hypothesis: The higher the conspiracy beliefs, the less concerned the respondents are about the danger of COVID-19 and the lower their support is for the introduction of quarantine measures. Our data are in line with the results of a sociological survey conducted in Russia in late May, when COVID-19 cases had almost peaked. At that point, 32.8% of respondents believed that the pandemic was "a fabrication by interested parties" or that "there will be no epidemic" (at the time of the survey, the number of coronavirus cases had reached 363,000). Compared to those who considered COVID-19 dangerous, those who did not were less likely to recognize the need for quarantine (74% vs. 10%) and more likely to violate quarantine restrictions — for example, by meeting relatives (42% vs. 18%), socializing with friends (41% vs. 12%), or taking walks (55% vs. 31%) (Artamonov & Lavrenťev, 2020).

Naturally, conspiracy theory believers were not the only ones violating quarantine. Reasons for disobeying quarantine restrictions can reflect situational needs (e.g., helping relatives) or have deep psychological roots. Individuals might resist restrictions not because they are opposed to them in principle, but because they associate the restrictions with "incorrect" and socially undesirable behavior. For example, it has been shown that individuals with high anxiety perceive people wearing masks, which are required during quarantine, as being ill or untrustworthy (Olivera-La Rosa, Chuquichambi, & Ingram, 2020). It is therefore not surprising that they themselves will try to wear masks as little as possible.

Nevertheless, belief in conspiracy theories contributes to the violation of quarantine measures and, as our study showed, Belief in Conspiracy Theories — together with assessment of the Danger of COVID-19 and Hopelessness — accounts for more than a quarter of variance in the Recognition of the Need for Quarantine indicator.

The study also shows that attitudes toward quarantine become more negative as its duration increases. On the one hand, this seems inevitable: A sudden change in the familiar situation, restriction of movement to an apartment, and confinement of socialization to the Internet cannot but elicit a desire to return to normal life. On the other hand, our study was conducted during the first three of the ten weeks of quarantine, when the restrictions should not have been perceived as such a burden yet. The students who participated in our study are among the social groups least affected by quarantine measures. Furthermore, at the time, the number of coronavirus infections was rising by 10–25% every day, so it should not have seemed that the authorities were too quick to introduce quarantine measures. Nevertheless, the

study showed that the date when the questionnaire was completed had an effect on attitudes toward the need for quarantine.

The second hypothesis concerned the link between conspiracy beliefs and hopelessness. As expected, there is a positive association between the two indicators. Hopelessness has a significant correlation with all items on the Belief in Conspiracy Theories scale and with the overall scale, accounting for 11% of variance of the scale. Just like conspiracy beliefs, Hopelessness has a negative association with perceptions of the Danger of COVID-19 and with the Recognition of the Need for Quarantine, and a positive association with feeling that there is insufficient information about the number of coronavirus infections in the country. There was also a striking lack of logic — if not a paradox — in the structure of the links of Hopelessness with other indicators: If COVID-19 is no more dangerous than the flu, or if the pandemic does not exist at all, and those who consider all reports about the coronavirus to be a conspiracy of dark forces are right, then why does it seem that we lack comprehensive information about the number of infections (there should be none at all) and, above all, where does the sense of hopelessness come from ("everyone will get sick," "people are powerless before the forces of nature," "no measures will help," and "the epidemic will develop along the same scenario everywhere")?

The data obtained most likely illustrate a lack of sensitivity to contradictions, which is typical of irrational thinking, and demonstrate a situation that promotes the emergence of conspiracy beliefs. Inability to respond to external threats and the feeling of not having enough information (along with fear that the real situation could be even worse) stimulate a desire to create an illusion of safety ("there is no pandemic"). However, the problem of lack of control over the situation remains. It is possible that, to some extent, disobeying quarantine restrictions serves as a surrogate for control, sustaining the illusion of control over the situation; however, the overall sense of the unpredictability of the situation cannot be overcome. To a certain degree, these speculations are supported by our data showing that the correlation between Hopelessness and the Danger of the situation are mediated by Belief in Conspiracy Theories.

The third hypothesis is related to the links that personality traits have with Belief in Conspiracy Theories and Recognition of the Need for Quarantine.

Our study did not confirm the hypothesis that personality traits can serve as predictors of conspiracy beliefs in a stressful situation such as the COVID-19 pandemic. Regression analysis showed that the only significant predictor of conspiracy beliefs is Honesty/Humility (the higher the scores for this trait, the less likely the individual is to believe in conspiracy theories); however, the overall effect of all personality traits that comprise the 6-factor model of personality (HEXACO) was not significant and accounted for only 3% of variance in conspiracy beliefs.

These results are not surprising. Although multiple studies have shown that belief in conspiracy theories is associated with Openness to Experience, Emotional Stability, and Agreeableness (e.g., Swami et al., 2011), these links were not reproduced in a meta-analysis (Goreis & Voracek, 2019). Our study also indicates that these links did not show through in a situation that raises anxiety levels and disrupts everyday life.

At the same time, it is clearly premature to abandon efforts to find links between factor-level traits and belief in conspiracy theories. Personality predisposition to

conspiracy beliefs in dangerous and unpredictable situation will likely emerge in extreme views — i.e., at the edges of the distribution rather than in the mean range, which masks personality predisposition.

In our study, we compared personality traits in extreme groups of conspiracy believers. When comparing the outermost groups based on items of the Belief in Conspiracy Theories scale, differences were found most frequently for Honesty/Humility. Honesty/Humility scores are significantly lower for groups that believe in conspiracy theories than for groups that do not. Since Honesty/Humility is associated with the moral aspects of behavior and is seen as a character trait that is opposite to the Dark Triad (Lee & Ashton, 2005; Lee et al., 2013), it stands to reason that individuals who are less sensitive to, or less concerned about, moral issues are more prone to conspiracy beliefs.

The effect of personality traits on recognition of the need for quarantine accounted for only 2% of variance; Emotionality and Conscientiousness were significant predictors of Recognition of the Need for Quarantine. Similar results (low contribution of personality traits to variance in quarantine-related behavior) were obtained when comparing the Big Five personality traits with COVID-19 voluntary compliance behaviors (Clark, Davila, Regis, & Kraus, 2020) and compliance with COVID-19 restrictions (Zajenkowski, Jonason, Leniarska, & Kozakiewicz, 2020). In the first of these two studies, researchers from the U.S., France, and Great Britain surveyed 8,317 respondents from 70 countries online. Respondents who believe that quarantine measures are effective in fighting the pandemic, who consider them important for protecting their own health, and who trust the government are more likely to comply with restrictions. Correlation analysis did not demonstrate a relationship between personality traits and compliance, and accounted for only 1% of variance in compliance behaviors. Two personality traits were significant predictors: The lower the Extraversion and Emotional Stability, the higher the compliance behaviors (Clark et al., 2020). In the second study, which was conducted online with a Polish sample (n = 263), the Big Five accounted for 2% of variance in compliance with restrictions; the only significant predictor of compliance with restrictions was Agreeableness (Zajenkowski et al., 2020). Thus, personality traits have virtually no effect on the recognition or non-recognition of the need for quarantine.

We should note that significant gender differences were only found for one indicator: Recognition of the Need for Quarantine. Women are more likely to support the introduction of quarantine measures. For all the other indicators — Belief in Conspiracy Theories, Danger of Coronavirus and COVID-19, and Hopelessness — there were no significant differences found between men and women.

Conclusion

The main conclusion of the study conducted during the first three weeks of quarantine is that belief in coronavirus-related conspiracy theories, along with denial of the danger of COVID-19 and hopelessness, have a significant effect on attitudes toward quarantine — the recognition (or non-recognition) of the need for quarantine and compliance with measures aimed at reducing the spread of infection.

The study serves as a description of the determinants of quarantine that essentially "lie on the surface." The next stage of the study will be to analyze more

thoroughly "existence and experience" during the quarantine period — from the time when it was first declared until the substantive easing of public quarantine measures.

Limitations

The sample of the study was relatively homogenous in age and social position, and it was a good representation of the European regions of Russia. However, the sample was not balanced in gender (there were three times as many women as men), and it was most likely not representative of the student population, because the participants were all volunteers.

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Effectiveness of Online Education for the Professional Training of Journalists: Students' Distance Learning During the COVID-19 Pandemic

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Background. The necessity to introduce digital technologies in education and in the professional training of journalism students in particular has been widely discussed in the theory and practice of education over the past 20 years. From the point of view of both future research and training, it becomes very important to study the development of journalists' professional competencies and professional identity in the online environment.

Objective. To study the experience of distance learning by students in the faculty of journalism at Lomonosov Moscow State University during the period of restrictive measures in connection with the COVID-19 pandemic (Spring 2020).

Design. A two-stage empirical project studied the opinions of students about distance learning, to identify its effectiveness for the formation of professional competencies and identity. In the first stage, a qualitative (investigative) study was conducted on a small sample using semi-formalized tools. In the second stage, a formal survey was conducted on a representative sample (N = 576).

Results. We found that in order to achieve the social, educational, and cognitive presence necessary for effective online education, an important condition is the communication environment and stable communication among all participants: students, professors, and academic departments. However, the communicative environment of the traditional training process is not transferred to the online environment in its original form. With Internet technologies, it is difficult to provide a strong teaching presence, which is a catalyst for the development of social and cognitive presence and a key component of traditional professional training. In the online learning mode, students are overloaded with self-study and written assignments, and mastering the necessary professional knowledge, competencies, and skills becomes their own responsibility.

Not all components of the traditional educational process (types and forms of classes, educational materials, etc.), remain effective when transferred to the online environment.

Conclusion. The formation of professional competencies, as well as the social, cognitive, and behavioral components that determine the further development of professional identity, is difficult in distance education. Online learning cannot be regarded as a full-fledged alternative to the traditional higher professional education of journalists.

Keywords:
professional identity, journalism students, online learning, teaching presence

Introduction

For two decades, Russia has been undergoing an active digital transformation. Digital media has become the driver of the emergence of qualitatively new characteristics, previously not inherent in the modern structure of society. Widespread media communication technologies, development of social media platforms, and the emergence of a new generation of "digital youth" (Soldatova, Rasskazova, & Nestik, 2017) have led to the dominance of digital media culture (Vartanova, 2019) and the formation of a digital educational environment (Blinova, 2020; Zvereva, 2019).

At present, digital technologies are crucial for the generation, transfer, and spread of scientific knowledge. This is not only because technology has changed science as such, but also because students, researchers, and professors apply them to their own academic practice, thereby transforming their fields of activity (Kramp, 2015). This is not just about the mediatization of communication and media research, but about changes in all disciplinary areas and niches of academic practice (Schäfer, 2014). This trend is confirmed by the fact that in the recent decades, online learning in the academic environment has been transformed from an experimental novelty into a full-fledged educational tool that is used almost everywhere. Already in 2011, over 75% of state colleges in the USA provided their students with a variety of online courses (Parker, Kim, & Lenhart, 2013), and as of the 2018–2019 academic year, 14 Russian universities have established e-learning faculties and departments[1].

But if before the COVID-19 pandemic, the active spread of online education allowed us to confidently assert only that every teacher and student would be involved in one or another of its forms at one of the stages of their training or career, then Q2 2020 showed that online learning is now an integral part of the educational process. In these conditions, the most important issue is how effective and relevant this form of training is for the training of specialists in each industry, in the development of both professional competencies and professional identity.

It is important to note that this article is not about well-planned online learning experiences, but about online learning during a crisis or disaster, which can only be considered as a temporary solution to an immediate problem and which researchers define as emergency remote teaching (Bozkurt et al., 2020; Hodges et al., 2020).

Training of students in the faculty of journalism at Lomonosov Moscow State University under the restrictive measures during the COVID-19 pandemic allowed us to collect sufficient empirical data for a primary analysis to determine whether it is possible to fully form the professional identity of journalists in the distance learning format, given the current development of digital technologies and on the basis of existing curricula.

It became necessary to introduce digital educational technologies and practices into the curricula of journalists about two decades ago. Already in the first decade of the 21st century, training in modern information technologies became an important part of journalism curricula (Shiryaeva & Svitich, 2007), and the universalization of journalistic processes in the context of media convergence required a search for fundamentally new approaches to training (Zassoursky, 2008). Among

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[1]   RusBase, "14 universities where you can get online education". https://rb.ru/list/vishka-udalenno/ (accessed on July 5, 2020).

the personal psychological adaptive characteristics in the new working conditions, the following were highlighted:

- ability to use innovative work technologies (cloud technologies, databases, etc.);
- ability to quickly "adapt to the language of digital media" (to master new digital technologies, as well as multimedia ways to receive and transmit information for effective work with media content);
- ability to self-organize;
- ability to communicate with audiences via social networks;
- ability to work as a team and involvement in the results of teamwork (Svitich, 2013).

"Since young people see the future in Internet journalism, professors need to follow the trends and use information and communication technologies in the educational process," N. Avdonina (2017) emphasized.

However, although demand in the media industry has required some revision of curricula or their refocusing to new digital standards, the number of disciplines in curricula required to solve these issues is still a topic of discussion in the scientific community, and multimedia and digital journalistic programs are not at the top of the list in Russian higher education. At the same time, the changes made in the curricula of most universities are not fundamental, but mainly involve the addition of disciplines for acquiring software skills (Vartanova & Lukina, 2014). A significant number of Russian journalism schools still focus on classical careers in print and broadcasting, and traditional competencies for journalists, reporters, and analysts are at the center of journalistic education. This is due to both the negative effects of regular long-term study online (Zinchenko et al., 2019), and the fact that the professional responsibilities of modern journalists still include traditional activities such as information gathering, news production, presentation and design of work, as well as editorial coordination and management. (Anikina, 2012). It has been empirically confirmed that regardless of the influence and extent of digital technologies, working with news and up-to-date information remains the essence of the journalistic profession. All this not only confirms the persistent relevance of the basic professional competencies and qualifications, but also reflects the traditional understanding and perception by journalists of their profession (Drok, 2014).

Despite this observed stability, the professional identity of journalists in its traditional meaning has been repeatedly called into question in the digital era. The decline in the importance of the gatekeeping function, the transition from monologue to regular and open dialogue with the audience, as well as the need to master new tools and media formats that form the modernized means of self-expression, have stimulated the research community to try to rethink journalistic roles and ideals (Eldridge & Franklin, 2018; Koljonen, 2013; Nygren, Dobek-Ostrowska, & Anikina, 2015).

Still, the professional identity of a journalist is permanent. "Regardless of the changes in technology or the economic situation, the journalist remains the journalist" (Craft & Davis, 2016). We can speak about "multiple" identities in journal-

ism only by classifying professional activity according to its specifics: TV journalist, business journalist, propagandist, etc. (Roccas & Brewer, 2002). However, "journalism is still based on real fact and journalistic analysis" (Vartanova, 2010), and the basis of the profession remains its original and essential characteristics associated with the need to promptly provide the audience with important, hard, new, interesting and useful information" (Svitich, 2013). This is also confirmed by the fact that even when evaluating the views of digital journalists about their professional identity, Eldridge and Franklin (2018) distinguish only the move away from traditional hard news to analytical content and "proximity to the audience" postulated by digital journalists themselves, but in the context of media commercialization, the audience is the most significant agent of influence *for any category* of modern journalists (Anikina, 2012).

Modern journalism involves professional responsibilities, creativity, and social activity (Vartanova, 2009). That is why it is so important that when students enter university, they feel like journalists, and that the professors are perceived by them as colleagues and do not only perform the function of educators. "In any discipline, you can and should recreate the editorial model; in general, the educational process can be given an editorial atmosphere," Avdonina (2017) recommends. She also notes that it is possible to construct a successful educational process that contributes to the formation in students of a sense of affiliation with the profession only by taking into account three components of professional identity: emotional, cognitive, and behavioral.

Garrison, Anderson, and Archer (2001) identify three main components of successful online education: social, educational (teaching), and cognitive "presence". The first is defined as "the ability of community members to project themselves socially and emotionally as real people through the used communication environment" (Garrison, Anderson, & Archer, 2000). The "teaching presence" is formulated by these researchers as "the development, promotion and direction of cognitive and social processes to achieve personally significant and educational learning outcomes" (Garrison & Anderson, 2003), and "cognitive presence" is interpreted as "the degree to which the participants of any particular configuration of the research community can create meaning through stable communication". Higher-order education in an online learning environment can be achieved only by promoting cognitive presence (Garrison, Anderson, & Archer, 2009).

Sun Anna and Chen Xiufang (2016) note that each presence plays a special role in development of the environment necessary for online learning. However, Ke (2010) emphasizes that it is the teaching presence that initiates the development of the student community and notes that cognitive presence in the online learning process can only occur if the teaching and social presence are well developed, and the development of social presence depends on how effectively the educational presence is implemented.

Evaluating the effectiveness of online learning, researchers also pay considerable attention to the role of the teacher in the organization and conduct of e-classes, including the development of online presentations, audio and video lectures, individual and group assignments, as well as recommendations for using the website on which the course is held (Garrison et al., 2009; Garrison & Arbaugh, 2007; Kupczynski, Ice, & Wiesenmayer, 2010). This aspect merits special attention, since

online education contributes to the integration of future journalists into the digital environment, and the use of the relevant technologies in the educational process for students is not only preferable, but also necessary.

Our empirical research was conducted to find out how effectively the three above-mentioned presences are fostered in distance education from the point of view of journalism students themselves, as well as how social, cognitive, and behavioral components that determine the further development of professional identity are formed in the online environment for future media professionals.

Methods

Procedure

The empirical study compiled students' opinions, attitudes, and assessments about various aspects of distance learning. It was conducted according to the exploratory sequential mixed methods design, in a two-phase project, from May to June 2020.

First, an exploratory qualitative study of a small sample of students was conducted by using an e-mailed semi-structured questionnaire with a large number of open-ended questions, which was the only available survey tool during the lockdown. With this tool, qualitative data was collected in the form of field texts (narratives of respondents) that reflect the participants' experience and contain explanations, interpretations, and insights that are important for understanding research problems[2]. Analysis of these texts allowed us to delve into the topic, clarify research problems, identify variables to test, and develop formal tools for a subsequent quantitative survey.

The second phase included the collection of quantitative data of a representative sample of students in the faculty of journalism at Lomonosov Moscow State University, by a formalized Web-based questionnaire (Survey Monkey software was used for designing, gathering, and analyzing survey data).

The quantitative and qualitative data was integrated during data analysis to provide a better understanding of the research problem.

Sample

The sample comprised students in the faculty of journalism at Lomonosov Moscow State University. In the first phase, an available sample of the students in the third year of a bachelor`s degree program was used to collect qualitative data; the sample included 68 students. The sample of the second stage was formed from the students of non-senior bachelor's (1, 2 and 3 years) and master's (1 year) degree programs. A total of 576 survey forms were received.

Results

The *force majeure* transfer to distance learning because of COVID-19 was accompanied by reorganization of the educational process and adaptation of traditional educational technologies to the online environment. Class hours were partially replaced by online classes with professors (via video conferences on various plat-

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[2]   The quotes from the respondents' narratives are highlighted in italics.

forms). This applied primarily to seminars and workshops, which were conducted according to the schedule on the Zoom online platform (less often, mostly at the beginning, via Skype), in the usual format of in-person seminars: questions and answers, discussion, reports, presentations by students.

The forms of online lecture classes were more diverse. In most cases, students received recorded lectures (audio/video files) or texts for self-study. These were sent to students by e-mail, sometimes posted on a special university website (learning portal) or YouTube. Online lectures (via video link with a professor) were less frequent — only a third of the respondents said that they had had such lectures.

In general, the transfer to distance learning has led to an increase in the study load and time spent. Almost all respondents (92%) noted an increase in study load; two-thirds (67%) felt this increase to be "significant", and 25% "insignificant". Three-quarters of the respondents (74%) indicated that they spent more time studying than they had before.

The increase in course load and time spent studying is primarily due to the increased amount of self-study. According to the students' assessment, only 20% of the total time spent studying was spent on scheduled online classes, and 80% on self-study, including written assignments, studying educational materials prepared by the professor (lectures, presentations, etc.), as well as required reading of fiction and recommended educational reading. Almost 40% of the study hours were spent on written assignments; this is the largest item of the "time" costs in the structure of the students' course load (*Table 1*):

Table 1

Distribution of study hours (in %) by types of study load in online learning (according to students' assessments)

Type of study load	%
Written assignments	37
Self-study of educational materials prepared by the professor (lectures, presentations, etc.)	21
Scheduled online classes with professor	20
Required fiction reading	14
Recommended educational reading	8

Although online classes with the professors took, on average, only 20% of the students' total study time, the vast majority of the respondents (94%) attended all or the most of the classes. One in four (26%) attended online classes more often than they had previously attended in-person classes. The high attendance at online classes could be explained by various reasons. First, attending online classes requires less additional effort and time (for preparation, travel, etc.). Second, with reduced personal contacts with professors and fellow students, the students began to appreciate this opportunity more and tried not to miss online classes with professors (the more so because the number of such classes decreased compared to the usual study mode, since many lecture courses were pre-recorded).

The students' attitudes and ratings of the online learning experience are po-larized: The number of those who generally liked this mode or whom it fit and the number of those who disliked or whom it didn't fit are equal (43% and 43%, *Figure 1*).
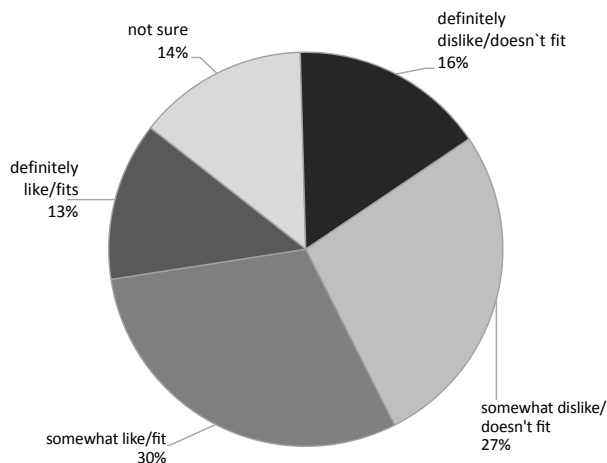
Figure 1. Assessment of distance education by students, % of those surveyed

Some students were ambivalent about the effectiveness of distance learning: 40% of the respondents believe that the effectiveness has decreased during the dis-tance mode, and 36% believe that it has not (24% were undecided).

This polarization of opinion reflects the contradictory nature of the online edu-cation process itself, which has both advantages and disadvantages (compared to traditional full-time education).

An obvious advantage of online learning, which received the maximum num-ber of positive ratings from students, is greater freedom in managing their own time: saving time spent on the road, greater independence in planning the sched-ule of their learning sessions. An important bonus is the ability to study while also holding down a job, without losing quality. Overall, 92% of the respondents indi-cated these advantages.

The second significant advantage for many students is comfort and conve-nience: They could wake up later (even for the earliest class); there is no need to "get prepared"; they can eat lunch listening to the recorded lectures or listen while sit-ting in a comfortable chair, lying on a sofa, etc. Psychological comfort can also in-clude the possibility to spend more time with family, which is significant for some respondents. The positive impact of the online learning format on the level of stress during classes, exams, and various types of tests was also noted. The comfort factor (home and psychological) was significant for 33% of the respondents.

But there are solid reasons for a negative attitude to distance education. First of all, this is a structural imbalance of the educational process, which is expressed in a significant increase in self-study and, above all, of written assignments and time spent on their completion. In our research, this received the highest number of negative ratings. Every second respondent (54%) pointed to the large number

of written assignments, and 38% complained about the large amount of self-study materials.

This imbalance is an unavoidable result of the transfer of the learning process to the online environment. Many lecture courses (primarily streaming lectures), as already mentioned, were replaced by recorded video or audio lectures and were often accompanied by the distribution of additional educational materials for self-study. Verbal and other classroom forms of academic testing and performance rating (reports, presentations, discussions, etc.) were replaced by written assignments.

The increased amount of self-study and the unjustifiably large (in the opinion of the students) volume of written assignments ("*for reporting*") contributed to the increase in feelings of fatigue and stress:

"*Education switches to self-learning in 90% of cases. Moreover, the deadlines for many assignments are set on weekends, which makes it seem as if the studying goes on for days.*"

"*The atmosphere of real education is lost. I feel like a bookworm who performs a huge number of tasks, and most of them are necessary neither for me nor the teacher, but 'for reporting' *".

"*Training began to take ALL my time; strengths were lacking.*"

The second significant reason for dissatisfaction with online learning is related to the degradation of the usual communication environment and communication models between students and professors. One in three (35%) respondents suffered from the lack of "live" communication with their fellow students. One in four (27%) complained about the lack of direct, live communication with professors. Students also said they lacked feedback from professors on assignments and test papers (24%). If the lack of communication with fellow students is more likely to be a psychological discomfort, the lack of direct contact and live communication with professors is directly related to the decreased effectiveness of the training process. "*Unavailability*", "*impossibility to contact*" some professors makes it difficult to master the educational material, according to the students:

"*All the material has to be self-studied, without the possibility to clarify any details*".

"*Some material is difficult to learn independently; there is no live communication*".

Students often interpreted the lack of the usual forms of communication in the online learning process as "low involvement" and "a negligent attitude" of professors, which offended them:

"*We work hard, but only a few people respond and really assess us. It is frustrating, as if you are wasting time, although you really try to complete the assignments effectively. I also don't like the fact that it is not always clear whether the mails reach the professor, and there is often no confirmation*".

In general, the research confirmed the high value of teaching presence for the students. This is also indirectly confirmed by the fact that students consider online seminars (via video link) with the professors the most effective form of classes during the distance learning mode (69% of respondents). And the attendance at such seminars was higher than in the usual mode.

The effectiveness of the training process depends on many factors, including subjective and individual ones — personal circumstances, living conditions, psy-

chological make-up of a student, etc. For example, some students (about 15%) indicate that they experienced problems with self-organization, self-discipline, and time management in the distant mode, and difficulties studying at home, with other family members present. One in three admit that they feel uncomfortable and less confident in online classes than in regular classes and prefer to remain silent. Adaptation to distance learning caused difficulties for almost half of the respondents (46%), and 17% were never able to fully adapt and experienced persistent difficulties and stress.

Discussion

The results of our research allow us to discuss the extent to which online education can effectively develop the professional competence of journalists and construct a successful training process that contributes to the formation of students' professional identity.

The two main problems in online learning identified in the study — the increased need for students' self-study and the lack of live communication with peers and professors — signal a weakening of the teaching presence in the online environment, which is the basis and catalyst for the development of social and cognitive presence. Transferring the learning process to the digital space of computer-mediated communication changes the interaction models of all participants. Not all students and professors are able to "project" themselves socially and emotionally in the online environment as well as they can in person. About a third of students feel less confident in online classes than in the classroom and prefer to remain silent. A weak social presence does not contribute to the formation of cognitive presence and, consequently, the cognitive component of professional culture.

The results of the study show that it was also problematic for professors to implement a successful social presence in the new communicative environment. Not all professors were able to successfully adapt academic tools to the conditions of the online environment, which led to a weakening of the educational presence, the basic component of a successful educational process. In an online communication environment, it is difficult to provide a strong educational (teaching) presence, as a result of which students are overloaded with self-study and written assignments, and mastering the necessary professional knowledge, competencies, and skills becomes their own responsibility.

Our research also showed that the educational and methodological support for the training of journalists is not transferred to the online environment without losses. Although professors were able to develop skills in creating online presentations, audio and video lectures, technical platforms for online classes, new formats for individual and group assignments, etc., not all courses in the journalism curriculum were adapted to the distance format, especially classes aimed at learning practical professional skills and competencies. In particular, case studies and the issue of educational media, according to the students, were ineffective and failed in the online mode.

At the same time, the forced experiment with online education led to new forms of training and teaching tools that passed "field testing". In particular, according to the students, recorded lectures were the most relevant form for online training,

and the most successful formats of the recorded lectures were video lectures either "with a presentation" (55%), or "with a teacher on camera" (52%). The recorded audio lectures format received slightly fewer votes (32%). Students would like to have access to a unified database of video lectures for each discipline to optimize the process of learning missed material, preparing for tests and exams. They positively assess the prospect of professors preparing a database of presentations in their disciplines, welcome digital forms for tests and online reporting (examinations and tests in Googledocs, Worddocs, etc.), which in the context of distance learning began to replace the archaic "paper" forms of tests and examinations. However, they do not consider digital learning materials as an adequate substitute for face-to-face classroom classes, but simply wish online materials (lecture records, notes, etc.) to systematically accompany (supplement) the face-to-face classes.

Conclusion

Based on the results of our empirical research, we can assess the components of the effectiveness of online education identified by Garrison, Anderson, and Archer (2001). We can talk about the weakness of the teaching presence, which is a catalyst for the development of social and cognitive presence and a key factor in the success of the educational process.

An important condition for the achievement of social, learning, and cognitive presence, necessary for effective online education, is a communication environment and sustainable communication among all participants — students, professors, academic departments. However, as our research shows, the communication environment of the traditional learning process is not directly transferred to the online mode. Many components of the traditional educational process and the formation of professional competencies of journalists lose their effectiveness when transferred to the online environment. In general, our research suggests that distance (online) education is not a full-fledged alternative to the traditional full-time education of journalists. However, it should be taken into account that our case is nontypical, since it is associated with an urgent transfer to distance learning format and the lack of appropriate training and time for adaptation of both educational technologies and teaching personnel and students. It seems that for more definite conclusions about the effectiveness of e-learning for professional training of journalists, more comprehensive research is necessary, comprising the digital media literacy of professors and students, testing the effectiveness of individual educational and methodological tools for the study of psychological readiness, and adaptation of professors and students to work in the online environment.

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Constructive Optimism, Defensive Optimism, and Gender as Predictors of Autonomous Motivation to Follow Stay-at-Home Recommendations During the COVID-19 Pandemic

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Background. This study is based on self-determination theory and the research on dispositional optimism and unrealistic optimism. Dispositional optimism is known to be protective of well-being and is related to adaptive coping strategies. Investigations related to unrealistic optimism, on the other hand, revealed that it may have both positive and negative consequences.

Objective. To investigate dispositional optimism and two kinds of specific optimism as predictors of autonomous motivation to follow stay-at-home orders during the COVID-19 pandemic in a sample of Russian young adults: constructive optimism, meaning belief in the role of effort; and defensive optimism, meaning unrealistic expectations and denial that a problem exists.

Design. A correlational (cross-sectional) study was conducted to measure adherence to the recommendation to stay at home, autonomous motivation, dispositional optimism, constructive optimism, and defensive optimism. An online survey was completed by 1,403 young adults (68% women) during the first month of lockdown.

Results. The findings demonstrate that constructive optimism and its underlying dispositional optimism predict both autonomous motivation and adherence to the recommendation to stay at home, while defensive optimism produces the opposite, undermining effects. Structural equation modeling revealed the effect of gender on adherence to the recommendation (higher in women), mediated by different types of optimism and autonomous motivation.

Conclusion. Dispositional optimism together with situation-specific constructive and defensive types of optimism are essential for explaining the health-related behavior and its motivation. These results contribute to self-determination theory, considering the role of personality factors in determining motivation.

Keywords: COVID-19 pandemic, constructive optimism, defensive optimism, dispositional optimism, autonomous motivation, stay-at-home orders, gender, well-being

Introduction

The coronavirus outbreak that started in December 2019 has caused significant disruptions to people's lives around the world. The seriousness of the risk, unpredictability of the situation, and uncertainty about how to control the disease make the situation especially stressful. The COVID-19 pandemic has led many countries to implement lockdowns. While lockdowns help to contain the spread of the virus, research in many countries shows that they also result in substantial damage to well-being and mental health (Agteren et al., 2020; Ahmed et al., 2020; Balkhi, Nasir, Zehra, & Riaz, 2020; Brodeur, Clark, Fleche, & Powdthavee, 2020; Brooks et al., 2020; Bu, Hanspal, Liao, & Liu, 2020; Globig, Blain, & Sharot, 2020; Huang & Zhao, 2020; Lei et al., 2020; Pervichko, Mitina, Stepanova, Koniukhovskaia, & Dorokhov, 2020; Solomou & Constantinidou, 2020; Stanton et al., 2020; Wang et al., 2020). For example, findings from researchers in China, the country which faced the COVID-19 first, have shown a prevalence of depression during quarantine up to 37% (Ahmed et al., 2020), and a prevalence of anxiety up to 35% (Huang & Zhao, 2020). In particular, a comparison study found significant differences in the prevalence of depression and anxiety between people in quarantine and people not in quarantine (Lei et al., 2020). Similarly, a recent Australian study (Agteren et al., 2020) demonstrated significantly worse outcomes on all mental health measures for participants measured during COVID-19, compared to those measured before ($p \leq .001$ for all outcomes, effect sizes ranging between $d = .32$ to $d = .81$). Research on Google Trends in Europe and the US (Brodeur et al., 2020) found a substantial increase in the search intensity for boredom, loneliness, worry, and sadness. Most research shows increase in anxiety, depression, and sleep disturbance. The reported increase in mental health issues due to physical distancing, quarantine, and social isolation makes further research in this area critical in order to identify groups at risk and to tailor appropriate interventions.

While most results suggest that people's mental health may have been severely affected by the lockdown and social control mechanisms, there are also some promising findings regarding quarantine's effects on mental health. First, not everyone experienced significant deterioration in mental health, including stress, anxiety, depression, and loneliness. Second, it seems that psychological well-being was only partly affected by the pandemic and lockdown. For example, studying a Russian sample, Rasskazova and colleagues (2020) have shown that life satisfaction and positive and negative emotions remained stable during the spring 2020 pandemic compared to previous years. Third, it seems that most people have adapted to the quarantine. Globig, Blain, and Sharot (2020) found that anxiety was significantly lower one month into lockdown relative to the beginning of lockdown, and people reported an increase in their sense of agency; optimism and happiness remained stable.

The only study on psychological predictors of positive behavior change (e.g., social distancing, improved hand hygiene) during the COVID-19 pandemic showed the role of fear of the virus in public health compliance (Harper, Satchell, Fido, & Latzman, 2020). It is unclear whether positive attitudes and beliefs matter.

Psychological and Demographic Factors Related to Stress and Declining Mental Health During the Pandemic

Psychological Factors

It is possible that the effects of lockdown are mediated by people's perception of the severity of the situation and specific cognitive strategies and personality variables, such as optimistic expectations and resilience. Optimism, hope, and self-efficacy are three cognitive variables representing positive expectations that proved to protect against development of PTSD (Gallagher, Long, & Phillips, 2020) and which may be helpful in overcoming psychological consequences of COVID-19-related stress. We found two studies which examined different types of optimism in the context of COVID-19-related stress and well-being (Arslan & Yildirim, 2020; Globig et al., 2020).

Globig, Blain & Sharot (2020) discovered that optimism regarding the COVID-19 pandemic was associated with people's positive feelings and this association was mediated by people's sense of agency over their future. Arslan and Yildirim's study (2020) indicated that optimistic cognitions and psychological inflexibility mediated the effect of coronavirus stress on psychological problems. However, we found no research on the role of constructive and inflexible optimism ("rose-colored glasses") and its role in well-being during the pandemic.

Gender and Other Demographic Factors

Most studies show the effect of gender (female), age (Solomou & Constantinidou, 2020), health problems (de Pedraza, Guzi, & Tijdens, 2020), and low income (Bu et al., 2020) on well-being during the COVID-19 pandemic. Studies on different samples have shown that women are especially vulnerable to COVID-related anxiety and depression (Adams-Prassl, Boneva, Golin, & Rauh, 2020; de Pedraza et al., 2020; Pervichko et al., 2020; Rasskazova, Leontiev, & Lebedeva, 2020; Solomou & Constantinidou, 2020; Stanton et al., 2020; Wang et al., 2020). This may be related to less tolerance of stress and less productive coping strategies during the COVID-19 pandemic displayed by women. Indeed, Rasskazova and colleagues (2020) have shown that women were less prone to use active coping strategies and humor during the pandemic; these strategies were related to higher well-being and better mental health.

Optimism, Well-Being, and Health-Related Outcomes

Our research is concentrated on different types of optimism as factors that promote adherence to the recommendation to stay at home during the self-isolation (quarantine) period, which was intended to protect health-related outcomes. Optimism represents trait-like positive expectancies conceptualized in the context of goal-directed behavior. Scheier and Carver (1985) define *dispositional optimism* as a personality trait representing the tendency to anticipate favorable outcomes to events. It is an important predictor of well-being and life satisfaction, and is associated with lower levels of anxiety and depression (Andersson, 1996; Carver & Scheier, 2014) and better physical health and longevity (Carver, Scheier, & Segerstrom, 2010; Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000). Optimism en-

hances people's motivation to pursue goal-oriented behaviors (Scheier & Carver, 1985) and is related to better subjective well-being in times of adversity (Carver et al., 2010).

Optimistic individuals have been reported to employ more *approach coping strategies* aiming to reduce, eliminate, or manage stressors or emotions, and fewer *avoidance coping strategies* seeking to avoid, ignore, or withdraw from stressors or emotions (Nes & Segerstrom, 2006). A recent meta-analysis shows that positive expectancies may protect against the development of posttraumatic stress disorder (PTSD) (Gallagher et al., 2020). Thus, dispositional optimism acts as a motivational mechanism important to mobilize cognitive and affective resources associated with well-being.

Since people are prone to be optimistic about life events, especially those happening in their own lives (Seligman, 2011; Sharot, 2012), they can sometimes rely on optimism too much. For example, some people "wear rose-colored glasses" and display unrealistic optimism. Goleman (1989) considers the individual's optimistic capacity for self-deception as a survival mechanism, which plays a vital role in the psyche of the healthy person. The function of denial is to soothe, maintain illusions, and promote well-being. Although positive illusions and expectations are prevalent in normal life and are often considered useful in some cases for maintaining a healthy mental state (Taylor et al., 2000), there is serious disagreement about whether they are beneficial or not. Colvin and Block (1994) conclude that it remains unproven whether unrealistic optimism, unrealistically positive views of the self, and illusions of control — three key positive illusions — foster mental health. Despite some new data showing that positive illusions, including self-enhancement and favorable comparisons with others, are related to high subjective well-being and low depressiveness (Dufner, Gebauer, Sedikides, & Denissen, 2019), we did not find strong empirical support for the health benefits of unrealistically positive expectations about the life-threatening events that are the object of our study.

Specific Types of Optimism: Constructive and Defensive Optimism

Dispositional optimism refers to stable personality characteristics that have important implications for regulating one's behaviors and maintaining well-being. Research suggests that specific types of optimism may be better predictors of COVID-19-related mental health outcomes (Globig et al., 2020) and behavior in stressful situation (Gassman, 2019) than is dispositional optimism. Gallaher et al.'s meta-analysis (2020) of positive expectations revealed that generalized self-efficacy has a weaker relationship with PTSD than specific self-efficacy. In the present research, we distinguish two specific types of optimism related to perception of threatening life events (the COVID-19 pandemic) — constructive optimism and defensive optimism.

Defensive optimism is a tendency to believe that the situation is not as bad as others (realistically) present it. Defensive optimism is similar to minimization, which is considered a type of cognitive distortion in cognitive-behavioral therapy; it is the opposite of exaggeration (Helmond, Overbeek, Brugman, & Gibbs, 2015). Minimization, or downplaying the significance of an event or emotion, is a com-

mon strategy for dealing with negative feelings such as guilt (Hoyk & Hersey, 2010). Defensive optimism is also close to self-deception involving denial.

Defensive optimism has a counterpart called *defensive pessimism* (Norem, 2008; Norem & Cantor, 1986); people use defensive pessimism as a strategy to prepare for anxiety-provoking events or performances. We suggest that both defensive pessimism and defensive optimism are motivated by anxiety. However, whereas the negative possible outcomes of a situation often motivate defensive pessimists to work harder for successful results, the prediction of positive outcomes does not motivate defensive optimists to take additional actions that may help to promote health-promoting false calm.

Whereas defensive optimism is an unrealistic belief in a positive future and/or optimistic expectancy of positive outcomes higher than the objective probability would warrant, *constructive optimism* refers to the belief in the role of effort, with a sense of control (Langer, 1975). Due to real persistence, constructive optimism may effectively prevent the spread of the virus. Both types of optimism deal with overcoming stressful situations, but constructive optimists acquire a sense of control and agency, believing in the role of efforts, whereas defensive pessimists seemingly succeed in coping with the anxiety related to uncontrollable events.

Autonomous and Controlled Motivation of Healthy Behavior

Any purposeful behavior implies the presence of motivation, including behavior associated with following the rules of quarantine and self-isolation. Self-Determination Theory (SDT) is one of the most influential contemporary theories of human motivation, which has successful applications in basically all domains of human life, including health and following a doctor's orders (Ryan & Deci, 2017). According to SDT, motivation differs not only in quantity, but also in quality, where "quality" refers to the relative degree of autonomy or self-determination (Ryan & Deci, 2000). *Autonomous motivation* comprises both intrinsic motivation and the types of extrinsic motivation in which people have identified with an activity's value and have integrated it into their sense of self. Conversely, *controlled motivation* consists of both introjected regulation, in which the regulation of action has been partially internalized and is energized by factors such as avoidance of shame and guilt, contingent self-esteem, pride, and external regulation, in which one's behavior is a function of external contingencies of reward, approval, or punishment.

In the health domain, it has been shown that autonomous forms of motivation are generally more effective in predicting health behavior than controlled forms (Hagger et al., 2014). Being autonomously motivated can promote engagement in and maintenance of health behaviors (Deci & Ryan, 2000; Ng et al., 2012; Patrick & Williams, 2012). Autonomous motivation has been positively associated with oral health behaviors (brushing and flossing one's teeth) (Halvari & Halvari, 2006), exercise and weight loss (Silva et al., 2011), healthy eating behavior (fruit/vegetable intake) (Dwyer et al., 2017; McSpadden et al., 2016; Shaikh, Yaroch, Nebeling, Yeh, & Resnicow, 2008), and it can predict health-related behaviors among adolescents, such as more physical activity and less marijuana use, smoking, and sexual intercourse (Gillison, Sebire, & Standage, 2012; Hardy, Dollahite, Johnson, & Christensen, 2015; Verloigne et al., 2011).

As to personality variables that predict autonomous motivation of healthy behavior, research to date is scarce. One study found that domain-specific optimism — optimism for the specific purpose of engaging in exercise — proved to be one of the best predictors of exercise engagement after autonomous motivation, whereas dispositional optimism was not related to exercise engagement and autonomous motivation (Gassman, 2019).

We hypothesized that defensive COVID-19-related optimism could have harmful consequences, undermining autonomous motivation to follow the recommendation to stay at home during a quarantine period. In particular, the effort to maintain healthy behavior during a pandemic can decrease if a person believes that the situation is not dangerous.

Methods

Given the theoretical and empirical evidence presented above, the purpose of the current study was to examine the mediating effects of the two types of specific optimism (constructive and defensive) and of autonomous motivation on the health-supportive behavior of Russian young adults, with respect to adherence to the recommendation to stay at home.

Prior to testing the mediation model, we first examined the psychometric properties of a new measure, the Constructive–Defensive Optimism Questionnaire (CODOQ), to enhance the scale's usability for both research and practice using the sample of the present study. Subsequently, we addressed the following specific research hypotheses:

H1: Constructive optimism would be positively associated with dispositional optimism and well-being, whereas defensive optimism would be negatively associated with dispositional optimism;

H2: Autonomous motivation would mediate the positive impact of constructive optimism on staying-at-home behavior;

H3: Autonomous motivation would mediate the negative impact of defensive optimism on staying-at-home behavior;

H4: In accordance with our previous research on dispositional optimism in Russian samples (Gordeeva, Sychev, & Osin, 2021), we expected that women would display higher dispositional optimism and constructive optimism than men.

Participants and Procedure

Participants were 1,403 students from different universities in two large cities in the Far East of Russia and the Urals. The sample comprised 956 (68%) women and 447 men, age $M = 20.59$, $SD = 3.66$. Participants completed a battery of questionnaires online. The study started on April 10, 2020, two weeks after the introduction of the self-isolation mode (lockdown) in Russia (March 25, 2020), and ended on April 25, 2020.

Measures

Development of the Constructive and Defensive Optimism measure. Based on the construct's definition and prior literature, a pool of six face-valid items was

generated to assess constructive and defensive optimism during the coronavirus pandemic. The content of the items reflects 1) the importance of efforts for coping with problems caused by the pandemic, along with the flexible view of the current situation typical of constructive optimism, and 2) defensive denial, including "positive" underestimation of the problem (similar to "rose-colored glasses") (see items of the questionnaire in *Table 1*). All items were rated on a Likert-type scale ranging from 1 (*absolutely do not agree*) to 5 (*totally agree*). The reliability coefficients (Cronbach's α) for all scales used in this study are presented in *Table 2*.

Dispositional optimism was assessed by the Russian version of the Life Orientation Test–Revised (Gordeeva et al., 2021; Scheier, Carver, & Bridges, 1994). This measure includes three positively worded items, three negatively worded items, and six filler items, rated on a scale from 0 (*strongly disagree*) to 4 (*strongly agree*).

Motivation to adhere to recommendations was measured with a questionnaire based on the UPLOC developed by SDT researchers (Sheldon, Osin, Gordeeva, Suchkov, & Sychev, 2017). This version of the questionnaire consists of one main question regarding the reasons for following the recommendations ("*Please explain the reasons why you are following these recommendations (at least to a small extent).*" "I plan to follow the recommendations and stay at home as much as possible, because…") and two subscales, each with 4 items, measuring autonomous and controlled motivation. Examples of the items are: "The recommendations reflect my values" (autonomous motivation) and "I don't want to be criticized for not following the recommendations" (controlled regulation). Respondents rated their agreement with each item on a scale from 1 (*not at all true*) to 7 (*very true*).

Adherence to the recommendation was measured with a single item asking about how much the person adheres to the recommendation to stay at home. Participants chose from 1 (*not at all*) to 7 (*totally follow this recommendation*).

To establish construct validity of the specific optimism measure, we used three additional well-being questionnaires. *Life satisfaction and happiness* were measured with Russian versions (Osin & Leontiev, 2020) of the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) and the Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999). The SWLS consists of five items which were rated on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*), and the SHS consists of four items rated on a 7-point scale. *Emotional well-being* was assessed using the Russian version of the Positive and Negative Affect Schedule (Osin, 2012; Watson, Clark, & Tellegen, 1988), which consists of two 10-item scales to measure both positive and negative affect over the last week. Each item is rated on a scale from 1 (*not at all*) to 5 (*very much*).

Data Analysis

Structural equation modeling was undertaken in Mplus 8, using robust maximum likelihood estimation (MLR). To assess the significance of mediated effects in the structural model, the bootstrap method, with 5,000 samples, was used in Mplus (Muthén & Muthén, 2015). Other analyses, including descriptive statistics, correlations analysis, exploratory factor analysis (EFA), and t-tests were carried out using R.

Results

Preliminary Analysis of the New Measure of Constructive and Defensive Optimism

To test the structure of the new measure of constructive and defensive optimism, we implemented EFA using the "minimum residuals" estimation method and parallel analysis for assessing the number of factors. The KMO measure of sampling adequacy (KMO = .69) and Bartlett's test of sphericity $\chi^2(15) = 1,859.74, p \leq .001$) both indicated that it was appropriate to apply factor analysis to this set of data. Two moderately correlated factors ($r = .20$) were extracted, which explained 48% of the total variance. Factor loadings after "oblimin" rotation, presented in *Table 1*, show that the empirical structure of the questionnaire corresponded to the hypothesized structure.

Table 1

Results of the exploratory factor analysis of the new measure of constructive and defensive optimism (N = 1,403)

Items	Factor loading	
	Factor 1	Factor 2
1. I believe that by making efforts, we can improve the situation and find optimal solutions to problems.	.00	.78
2. I think that everyone is exaggerating; in fact, this virus is not as dangerous as they say.	.81	−.02
3. I think that now we must hope for the best, but prepare for the worst and remain calm.	−.01	.55
4. The people around me and the media overstate the problem; in fact, everything will be fine.	.69	.08
5. I believe that our efforts can help prevent the spread of the disease.	.00	.66
6. In the current situation, we have nothing to worry about; I do not see any real danger.	.62	−.08
Eigenvalues	1.52	1.37
Percentage of explained variance	25%	23%

Further, we tested the fit of the model with two correlated factors using CFA. Cross loadings and covariances between items were not allowed. The results of analysis indicated a good fit of this model: $\chi^2 = 27.11$, $df = 8$, $p \leq .001$, CFI = .985, TLI = .971, RMSEA = .041 (90% CI = [.025, .059]), PCLOSE = .777, $N = 1,403$. All factor loadings were higher than .55 and significant at $p \leq .001$; correlation between latent factors was −.28 ($p \leq .001$). The reliability coefficients (Cronbach's α) of scales were .70 for constructive optimism and .75 for defensive optimism.

The construct validity of the scales of constructive and defensive optimism is confirmed by the correlations with well-being indicators (see *Table 2*). As expected, constructive optimism showed weak positive correlations with indicators

of well-being such as positive affect, satisfaction with life, and subjective happiness (*r* from .12 to .17; both at $p \leq .001$), while defensive optimism did not correlate with any indicators of well-being (*r* from −.02 to .03; none are significant). These results indicate that constructive optimism may help to maintain a higher level of well-being during a pandemic, but defensive optimism, as a relatively ineffective type of coping with problems, is irrelevant for well-being. Accordingly, we found the opposite correlations of dispositional optimism with constructive (*r* = .25; $p \leq .001$) and defensive optimism (*r* = −.07; $p \leq .01$), which confirms that the last two constructs are completely different in nature.

Correlations of Different Types of Optimism with Health-Related Variables and Gender

Health-related variables showed the expected correlations with these two specific types of optimism (see *Table 2*). In particular, constructive optimism was moderately positively associated with autonomous motivation (*r* = .45; $p \leq .001$) and adherence to recommendations (*r* = .28; $p \leq .001$). The opposite, negative correlations, were found between defensive optimism and autonomous motivation (*r* = −.29; $p \leq .001$) and adherence to recommendations (*r* = −.15; $p \leq .05$). In addi-

Table 2

Descriptive statistics and correlations between different types of optimism, motivation, adherence to recommendations and well-being (N=1,403)

	α	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Constructive optimism	.70	4.00	0.83	1	−.20***	.24***	.44***	.03	.26***	.12***	−.07**	.16***	.16***
2. Defensive optimism	.75	2.48	0.9	−.20***	1	−.06*	−.28***	.15***	−.14***	.01	−.01	.02	.01
3. Dispositional optimism	.78	2.43	0.73	.25***	−.07**	1	.17***	−.13***	.08**	.37***	−.29***	.41***	.55***
4. Autonomous motivation	.81	5.46	1.42	.45***	−.29***	.20***	1	.26***	.41***	.14***	−.02	.16***	.14***
5. Controlled motivation	.73	3.71	1.66	.03	.15***	−.13***	.25***	1	.09***	−.05	.11***	0.00	−.10***
6. Adherence to recommendations	–	6.15	1.25	.28***	−.15***	.06*	.40***	.09***	1	.05*	−.07*	.11***	.06*
7. Positive affect	.89	2.98	0.77	.12***	.01	.37***	.14***	−.05	.06*	1	−.50***	.45***	.52***
8. Negative affect	.88	2.58	0.84	−.05	−.02	−.31***	−.04	.11***	−.05	−.49***	1	−.35***	−.47***
9. Satisfaction with life	.80	3.26	0.73	.15***	.03	.42***	.17***	.00	.11***	.45***	−.35***	1	.57***
10. Happiness	.76	4.24	1.27	.17***	.01	.55***	.14***	−.10***	.07*	.52***	−.46***	.57***	1

Note. The correlations controlled for gender are presented above the diagonal; the zero-order correlations are presented below the diagonal; *p ≤ .05, **p ≤ .01, ***p ≤ .001; α = Cronbach's α.

tion, defensive optimism demonstrated weak positive correlation with controlled motivation ($r = .15$; $p \leq .001$).

Participants reported significantly higher autonomous motivation to follow stay-at-home recommendations ($M = 5.46$, $SD = 1.42$) compared to their controlled motivation ($M = 3.71$, $SD = 1.66$), and both types of motivation were related to stay-at-home behavior, with much stronger correlation in the former case ($r = .40$; $p \leq .001$).

Analysis of differences between men and women using Welch's *t*-test (see *Table 3*) demonstrated that women were more prone to follow the recommendation to stay at home (at $p \leq .001$), and were also higher in constructive optimism, dispositional optimism, and autonomous motivation (all $p \leq .001$), while men were slightly higher than women in defensive optimism ($p \leq .05$). Most of these differences were small; however, the effect of gender on autonomous motivation was medium (Cohen's $d = .45$).

Given that many study variables turned out to be dependent on gender, we included it as a controlled variable in all statistical analyses. Correlations among study variables controlling for gender (see *Table 2*, above the diagonal) were close to the zero-order correlations.

Table 3

Gender differences in different types of optimism, motivation, adherence to recommendations, and well-being

	Means		SD		Welch's *t*-test	*df*	*p*	Cohen's *d*
	Female (N = 956)	Male (N = 447)	Female	Male				
1. Constructive optimism	4.08	3.81	.76	.94	5.34	724.8	≤ .001	.33
2. Defensive optimism	2.44	2.57	.88	.93	−2.40	830.8	.017	.14
3. Dispositional optimism	2.51	2.25	.73	.69	6.30	918.2	≤ .001	.35
4. Autonomous motivation	5.66	5.04	1.31	1.55	7.35	754.4	≤ .001	.45
5. Controlled motivation	3.72	3.67	1.68	1.62	.56	899.2	.577	.03
6. Adherence to recommendation	6.25	5.94	1.13	1.46	3.93	703.0	≤ .001	.25
7. Positive affect	2.99	2.94	.74	.82	1.22	801.7	.223	.07
8. Negative affect	2.64	2.44	.83	.86	4.07	847.9	≤ .001	.24
9. Satisfaction with life	3.25	3.29	.73	.72	−1.04	885.8	.300	.06
10. Happiness	4.28	4.15	1.27	1.27	1.80	869.4	.071	.10

Structural Equation Modeling of Relations among Gender, Different Types of Optimism, and Health-Related Variables

We applied structural equation modeling to analyze the overall effect of different types of optimism and motivation on following the recommendation to stay at home. Adherence to the recommendation was included in the model as a dependent variable, along with the factor of autonomous motivation as its main predictor and two factors of constructive and defensive optimism. Given the small effect of controlled motivation on adherence to the self-isolation recommendation and its weak correlations with different types of optimism, the factor of controlled motivation was not incorporated into the model. We expected that the effect of constructive and defensive optimism on adherence to the recommendation may be direct or mediated by autonomous motivation. On the basis of the observed correlations, we added to the model the factor of dispositional optimism (with an auxiliary orthogonal factor of response style needed for explaining shared variance of negatively worded items) as a predictor of constructive and defensive optimism. Last, we included gender as a predictor of all other variables to control for its effects. Estimation of this model showed that there were four insignificant parameters in spite of acceptable values of fit indices. After exclusion of these insignificant parameters, we obtained the model presented in the *Figure 1* below, which had a satisfactory fit: $\chi^2 = 416.81$; $df = 125$; $p \leq .001$; CFI = .946; TLI = .935; RMSEA = .041 (90% CI = [.037, .045]), PCLOSE = 1, $N = 1,403$.
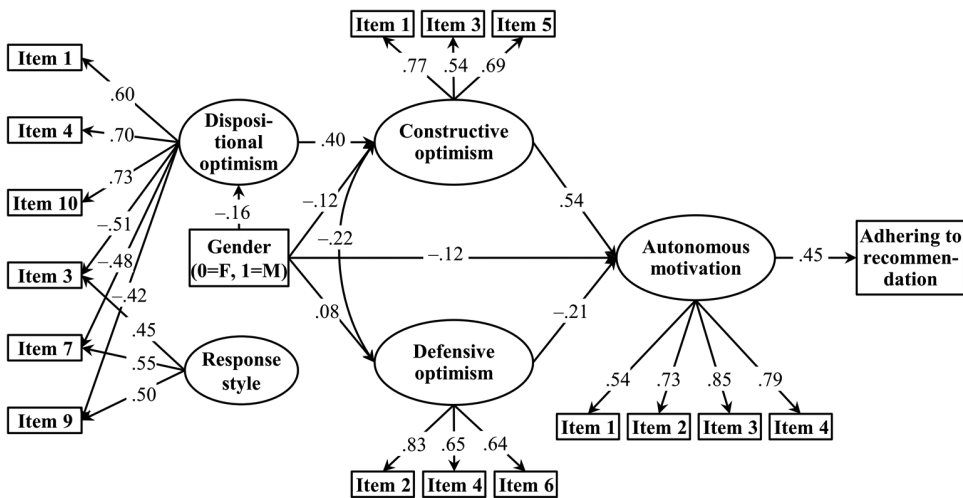
Figure 1. The structural model of relations among the different types of optimism, autonomous motivation, and adherence to the self-isolation recommendation, controlling for gender (all coefficients are standardized and significant at p ≤ .05, N = 1,403).

Analysis of the indirect effects of different types of optimism and of gender on following the recommendation to stay at home in the presented structural model revealed that all tested effects were statistically significant (see *Table 4*).

Table 4

Indirect effects of different types of optimism and gender on adherence to the recommendation of self-isolation

Predictors	Mediators	Standardized indirect effect	p
Constructive optimism	Autonomous motivation	.24	≤ .001
Defensive optimism	Autonomous motivation	−.10	≤ .001
Dispositional optimism	Autonomous motivation and constructive optimism	.10	≤ .001
Gender	Autonomous motivation, defensive optimism, constructive optimism, and dispositional optimism	−.11	≤ .001

Thus, the structural model reveals that adherence to the recommendation to stay at home depends on constructive situation-specific optimism, and underlying it, dispositional optimism via autonomous motivation. At the same time, the "adherence to the self-isolation recommendation" variable is inversely related to defensive optimism via autonomous motivation. The effect of gender on adherence to the recommendation is fully mediated by different types of optimism and autonomous motivation.

Discussion

We found that compliance with quarantine rules during the COVID-19 pandemic significantly depends on personality and motivational variables, primarily optimistic beliefs and autonomous motivation. Based on the literature on dispositional optimism, unrealistic optimism, and defensive pessimism, we differentiated two types of specific optimism in the context of the COVID-19 pandemic: constructive and defensive optimism. As predicted, we have shown that situation-specific optimistic beliefs may have different forms — constructive and defensive — with different motivational and behavioral consequences related to the COVID-19 pandemic. Constructive optimism includes belief in the importance of efforts for coping with problem and a sober assessment of its real difficulties, while defensive optimism implies "positive" underestimation of the problem and its denial.

With regard to the psychometric properties of the newly developed specific optimism measure, the results confirmed that it is a valid and reliable measurement instrument for assessing COVID-19-related optimism, demonstrating satisfactory internal consistency. The questionnaire showed satisfactory reliability of the scales and its two-factor structure was successfully confirmed using EFA and CFA. The two types of specific optimism were weakly negatively interrelated and showed opposite associations with general dispositional optimism and well-being.

Structural modeling showed that constructive and defensive optimism have the expected effects on the autonomous motivation to follow the recommendation to stay at home, and indirectly (via motivation) on real adherence to this recommendation. Both dispositional optimism and specific constructive optimism predict au-

tonomous motivation and health-related behavior, while defensive optimism has the opposite, undermining, effects. The discovered gender differences in these two types of optimism provide a possible explanation for better adherence to the recommendations typical of women, confirmed by the results of structural modeling and analysis of indirect effects. Finally, our results on gender differences are consistent with those obtained by other researchers. In particular, Solomou and Constatinidou (2020) showed that males reported lower levels of compliance with precautionary measures.

Following previous research on self-control (Holding, Hope, Verner-Filion, & Koestner, 2019), these results contribute to self-determination theory considering personality predictors, i.e., the role of generalized and specific optimism in autonomous motivation related to healthy behavior. Previous research in this field has mostly concentrated on environmental predictors of autonomous and controlled motivation.

Conclusion

Our results suggest that in addition to dispositional optimism, situation-specific constructive and defensive optimism are essential for explaining the health-related behavior. While constructive optimism supports adherence to the recommendation to stay at home via autonomous motivation, defensive optimism undermines it. These results contribute to self-determination theory, considering the role of personality factors in determining motivation.

Implications and Limitations

Our study has important practical implications. High dispositional optimism and constructive specific optimism and low defensive optimism impact the quality of motivation and promote adaptive health behavior during a pandemic. This means that support for realistic optimistic beliefs is recommended to mass media and public institutions, to promote both healthy attitudes and behavior. This is, of course, easier said than done, but doctors and the media should strive for a realistic and at the same time optimistic reflection of COVID-19 related events.

A limitation of this research was the participants' age, mostly under the age of 30. Prior studies showed that dispositional optimism tends to decline in older age (Gordeeva et al., 2021; Hinz et al., 2017), so the age-related changes in constructive and defensive optimism need further research. Also age was found to be a significant predictor of reactions to COVID-19-related stress (de Pedraza et al., 2020; Solomou & Constantinidou, 2020), with young people suffering more (Pervichko et al., 2020). Future studies may benefit from considering whether constructive and defensive optimism are associated with changes in motivation quality and well-being over time. Thus, a longitudinal design is preferable in the future to understand the causal role of both dispositional and constructive optimism in COVID-related health behavior and well-being.

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Coping Responses During the COVID-19 Pandemic: A Cross-Cultural Comparison of Russia, Kyrgyzstan, and Peru

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Background. The COVID-19 pandemic has subjected people around the world to severe stress, evoking a variety of coping responses. Coping responses can be broadly classified into four strategies: 1) problem-focused coping; 2) emotion-focused coping; 3) socially supported coping; and 4) avoidance. While there is a wide variability of individual coping responses, to some extent they are also culturally specific.

    Objective. This study aimed to compare the differences in the prevalence and factor structure of coping responses during COVID-19 pandemic in three countries: Russia, Kyrgyzstan, and Peru.

Keywords:
coping behavior;
coping strategies;
COPE;
cross-cultural differences;
factor structure.

Design. The sample included 501 participants from Russia, 456 participants from Kyrgyzstan, and 354 participants from Peru. The mean age of participants was 28 years in Russia (SD = 13.5); 24 years in Kyrgyzstan (SD = 10.0); and 30 years in Peru (SD = 12.3). In Russia and Kyrgyzstan, coping strategies were assessed with an abbreviated Russian adaptation of the COPE (Coping Orientations to Problems Experienced) questionnaire. In Peru, coping responses were assessed using the Spanish version of the Brief COPE questionnaire. The average scores from fifteen COPE scales were used as the input data for linear modelling and factor analysis.

Results. The coping scores varied substantially within each country. Differences between countries accounted for 17.7% of the total variability in religious coping; 15.8% in acceptance; 13.9% in mental disengagement; and less than 7% in the other coping strategies. No difference in the prevalence of coping responses was found between Russian and Kyrgyz participants after accounting for age and gender. In all three countries the coping responses were associated with the same four coping domains: problem-focused coping, socially supported coping, avoidance, and emotion-focused coping. Four factors explained up to 44% of the total variation in the COPE scores. Religious coping and mental disengagement were classified into different coping domains in the three countries.

Conclusion. The results suggest that during the COVID-19 pandemic, people from different countries apply the full range of coping responses within the four universal coping strategies. Religious coping and mental disengagement differed the most across the countries, suggesting that some coping behaviors can take on different roles within the system of coping responses to stressful events. We attribute these differences to differing cultural and socioeconomic characteristics, and the different measures taken by governments in response to COVID-19.

Introduction

The COVID-19 pandemic has affected many aspects of people's day-to-day lives. The measures initiated by societies around the world to combat the spread of the virus have included obligatory home confinement and social distancing. The common sources of fear during the pandemic are: risk of infection of self and significant others; shortage of supplies; healthcare collapse; loss of income; global societal and financial crises; and the undefined duration of quarantine (Brooks et al., 2020; Mertens et al., 2020). The circumstances of the COVID-19 pandemic have led to a notable increase in individual anxiety, depression, and other symptoms of distress (Xie et al., 2020; Zacher & Rudolph, 2020). It is therefore important to document a variety of coping responses that can allow people to overcome the stresses of the pandemic.

Coping refers to a range of behavioral and cognitive mechanisms (strategies) intended to deal with stress. To a great extent, modern understanding of coping responses follows the model proposed by R.S. Lazarus and S. Folkman (Biggs et al., 2017; Lazarus & Folkman, 1984). That model portrays a coping response as an interaction between a person and his/her environment, as guided by a personal appraisal of the stress being experienced, and involving the mobilization of personal resources.

Lazarus and Folkman (1984) identified two distinct methods of coping: 1) *problem-focused coping,* which aims to directly manage the source of stress, and 2) *emotion-focused coping,* which aims to regulate the emotions arising as a result of stressful events or situations. Later classifications extended this taxonomy by adding *avoidant coping* (resorting to distracting activities or denying the source of stress), and *socially supported coping* (resorting to advice, help, or emotional support from others) (Baumstarck et al., 2017; Carver et al., 1989; Litman, 2006).

The most commonly used questionnaire to measure coping behaviors is COPE, as developed by C.S. Carver (Carver et al., 1989). The COPE questionnaire measures 15 coping strategies:

1. *Acceptance* — submitting to the reality of the situation;
2. *Active coping* — active or direct actions to overcome a stressful situation;
3. *Behavioral disengagement* — refusal to actively deal with the stress;
4. *Denial* — refusing to believe in what happened or attempting to deny its reality;
5. Seeking *emotional support* — looking for empathy and understanding from others;
6. *Humor* — making jokes and laughing about the situation;
7. Seeking *instrumental support* — asking others for advice, help, or information;
8. *Mental disengagement / Self-distraction* — engaging in activities to get distracted from unpleasant thoughts associated with the problem, daydreaming, sleeping;
9. *Planning* — thinking about how to deal with a difficult life situation, developing strategies for action;
10. *Positive reinterpretation* — reappraising a stressful situation in a positive way;
11. *Religion* — appealing to the help of God, faith, religion, or meditation;
12. *Restraint* — keeping oneself from carrying out inconsiderate actions in response to the stress (not present in Brief COPE);
13. *Substance use* — using alcohol, drugs, or medications to get distracted from a stressful situation;
14. *Suppression of competing activities* — putting aside activities that do not help solve the problem (not present in Brief COPE);
15. *Venting* — expressing negative emotions.

The original COPE questionnaire included four items for each coping scale, thus 60 items in total. Later, a short version (Brief COPE) was developed that included 13 original scales: acceptance; active coping; behavioral disengagement; denial; emotional support; humor; instrumental support; self-distraction (originally mental disengagement); planning; positive reframing (originally positive reinterpretation); religion; substance use; and venting. It also added a self-blame scale (criticizing oneself for responsibility in the situation) (Carver, 1997).

Brief COPE included two items for each coping scale, for 28 items in total. The COPE questionnaire became the most frequently used tool to assess coping strategies, having been used in 20% of all published research on coping between 2000 and 2013, including studies on coping with health issues, interpersonal stress, work stress, and caregiving (Kato, 2015).

Coping strategies have been studied all around the world. The occurrence and the structure of broad coping dimensions proved to be subject to cross-cultural differences, since culture both informs and limits effective approaches to overcoming stress (Sica et al., 1997). For example, in a study of stress coping in university students, Asian students were more likely to attempt religious coping than European students (Chai et al., 2012). Another study compared coping behaviors of Mexican citizens in the United States with Mexican-Americans and non-Hispanic citizens of the United States (Farley et al., 2005). Compared to other groups, Mexican citizens were less likely to engage in substance use or self-distraction, and more likely to use denial and religious coping. With regard to social support, Asian and Asian American individuals proved to be more reluctant to explicitly ask for support from others than European Americans (Kim et al., 2008).

Likewise, factor analysis of COPE and Brief COPE items and scales yielded heterogeneous results across different populations. For example, a three-factor structure was found in a Spanish sample using COPE: engagement, disengagement, and help-seeking (Gutiérrez et al., 2007). Four and five factors were found in French samples using Brief COPE: social support, problem solving, avoidance, and positive thinking (Baumstarck et al., 2017); and problem solving, support seeking, avoidance, cognitive restructuring, and distraction (Doron et al., 2014). Three factors were found using the Brazilian-Portuguese version of Brief COPE: religion and positive reframing, distraction, and external support (Brasileiro et al., 2016). Religious coping proved to be one of the most fluid strategies in terms of its relationship with other coping responses (Krägeloh, 2011).

A handful of research papers have addressed the individual differences in coping responses during the COVID-19 pandemic in different countries. The cultural nature of coping responses is noticeable in relation to the appraisal of the risk of the disease. A study in Vietnam showed that the perception of risk from COVID-19 was associated with social media usage and geography (Huynh, 2020). In Europe and United States, the fear of COVID-19 was positively associated with information intake from regular and social media, and was driven primarily by fear for loved ones and health anxiety (Mertens et al., 2020). A study in Germany showed that people used a full range of coping strategies in response to the COVID-19 pandemic (Zacher & Rudolph, 2020). Problem-focused, emotion-focused, and socially supported strategies predicted higher levels of life satisfaction and positive affect in this study, and avoidant coping predicted higher levels of negative affect.

On the other hand, both problem-focused and avoidant coping predicted less anxiety, sleep problems, and cognitive alterations in response to home confinement in children and adolescents from Italy, Spain, and Portugal (Orgilés et al., 2020). The authors found that the most frequently used coping strategies in all three coun-

tries were 1) accepting the reality of confinement; 2) engaging in social activities; 3) ignoring the events or acting as if nothing is happening; and 4) highlighting the positive aspects of staying at home. However, differences in coping responses were also discovered: Portuguese children more frequently reacted with humor; Spanish children more frequently collaborated with social activities, sought comfort from others, or acted as if nothing had happened; and Italian children more frequently seemed unworried.

The present study aims to extend the evidence on coping responses during the COVID-19 pandemic in different cultural and socio-economic contexts. We use data on coping strategies measured by the Russian and Spanish versions of the COPE questionnaire to 1) compare the occurrence of coping responses, and 2) describe the broad dimensions of coping strategies in three countries: Russia, Kyrgyzstan, and Peru.

Methods

Participants and Procedure

The study involved 501 participants from Russia (mean age 28 years, 76% female), 456 participants from Kyrgyzstan (mean age 24 years, 85% female) and 354 participants from Peru (mean age 30 years, 63% female).

The data from Russia and Kyrgyzstan were collected as a part of a larger study that aimed to explore the psychological impact of the COVID-19 pandemic on students and teachers in regular schools, colleges, and universities. University students constituted a large majority of the Russian and Kyrgyz samples (69% and 83% respectively). The other participants from Russia and Kyrgyzstan were university and school teachers. Likewise, the Peruvian data came from a larger study that aimed to explore the associations between metacognitions, coping strategies, and mental health during the COVID-19 pandemic. In total, 53% of participants from Peru were university students. University students were on average younger than other participants, with lower variability of age in all three countries. A detailed account of sample characteristics is presented in *Table 1*.

The research projects in Russia and Kyrgyzstan received ethical approval from the corresponding institutional boards. Participants were eligible if they were over 18 years. They were informed about the anonymous and confidential nature of the research and gave informed consent before proceeding to fill out the questionnaires. Participation was voluntary and could be withdrawn by a participant at any moment without further explanation.

Responses were collected through an online survey. In Russia and Kyrgyzstan, participants were recruited by their educational organizations, which distributed the link to the online survey (Nikulchev et al., 2019, 2020). In Peru, the link to the survey was disseminated by the authors by an email invitation or through social media platforms (Facebook, WhatsApp, LinkedIn, etc.).

The Russian and Kyrgyz data were collected between May 11 and June 5, 2020. Peruvian data were collected between April 14 and June 5, 2020.

Table 1

Sample summary

Country/group	n	Age, years				Gender, %		
		M	SD	min	max	Male	Female	N/A
Russia								
All	501	28.0	13.5	18	73	22.2	76.0	1.8
University student	348	20.2	2.5	18	37	22.4	75.6	2.0
University teacher	153	45.7	11.6	25	73	21.6	77.1	1.3
Kyrgyzstan								
All	456	23.8	10.0	18	80	13.8	85.1	1.1
University student	378	20.0	1.9	18	30	12.7	86.2	1.1
University teacher	23	48.3	13.7	22	69	17.4	82.6	0.0
School teacher	55	39.4	11.7	22	80	20.0	78.2	1.8
Peru								
All	354	29.5	12.3	18	70	37.3	62.7	0.0
University student	186	21.7	5.1	18	70	34.9	65.1	0.0
Other	168	38.2	12.0	18	70	39.9	60.1	0.0

Materials

To assess coping behaviors in Russia and Kyrgyzstan, we developed an abbreviated version of the COPE questionnaire (60 items, Carver et al., 1989) which had been adapted for Russian speakers by Rasskazova, Gordeeva, and Osin (2013). The Russian COPE questionnaire was abbreviated to meet time constraints in data collection in Russia and Kyrgyzstan. The items with the lowest factor loadings in Rasskazova et al. (2013) were omitted; the abbreviated version of the Russian COPE included 32 items from 14 COPE scales (the restraint scale was omitted entirely). Each scale was represented by 1 to 4 items. To assess coping behaviors in Peru, we used the Spanish adaptation of Brief COPE (Carver, 1997; Morán et al., 2010). The Spanish adaptation of Brief COPE included 28 items from 14 Brief COPE scales. Each scale was represented by two items. The number of items in each scale and their reliability are reported in *Table 2*.

Participants from Russia and Kyrgyzstan were asked to rate how often they used the ways of coping described by the COPE items. The stressor event was not overtly specified; however, since the preceding questionnaire in the battery referred to the participants' personal experience of COVID-19, we suggest that the responses to COPE were guided by this context. The participants were provided with four options: "I never do this," "I do this a little," "I do this quite a lot," and "I do this very often." The responses were recorded as integers in a range from 1 to 4.

Participants from Peru were asked to rate their coping behaviors in response to lockdown. They responded by rating each item by an integer in a range of 0 to 3, where 0 = "I never do this," 1 = "I do this a little," 2 = "I do this a lot," and 3 = "I do

this always." To make the responses comparable across the three countries, we re-labeled the responses to correspond to a range of 1 to 4 and computed an average score for each original COPE scale as a sum of item scores, divided by the number of items in the scale.

Table 2

Reliabilities of COPE questionnaires used in the study

COPE scale	Russian COPE (32 items)			Spanish Brief COPE (28 items)	
	N items	alpha (Russia)	alpha (Kyrgyzstan)	N items	alpha (Peru)
Acceptance	4	0.846	0.765	2	0.508
Active coping	2	0.519	0.473	2	0.714
Behavioral disengagement	2	0.315	0.488	2	0.609
Denial	2	0.558	0.542	2	0.779
Emotional support	2	0.732	0.720	2	0.759
Humor	2	0.748	0.673	2	0.792
Instrumental support	2	0.742	0.674	2	0.711
Mental disengagement / Self-distraction	4	0.480	0.537	2	0.444
Planning	2	0.706	0.660	2	0.489
Positive reinterpretation/ reframing	2	0.810	0.741	2	0.557
Religion	4	0.909	0.923	2	0.829
Substance use	1	–	–	2	0.809
Suppression of competing activities	1	–	–	–	–
Venting	2	0.739	0.651	2	0.597
Self-blame	–	–	–	2	0.543

Note. COPE-32 is an abbreviated Russian adaptation of the original COPE (Rasskazova et al., 2013). COPE-28 is a Spanish adaptation of Brief COPE (Moran et al., 2010). alpha = Cronbach's alpha

Analysis

To compare coping behaviors across the three countries, we computed descriptive statistics (mean and standard deviations) for each COPE scale in each country. We applied a set of independent linear models to assess which part of the variability of COPE scores was accounted for by country (main predictor), and which by age, gender, and gender-by-country interaction (control variables). The interaction was included in the model to account for the uneven distribution of male and female participants across countries. We estimated marginal means in groups by

gender, country, and gender-by-country, and performed pairwise post hoc comparisons by gender and country (Tukey's honestly significant difference test). To account for multiple testing, we adjusted significance thresholds by the number of models (15).

Taking into account the high heterogeneity of the broad coping dimensions across the populations, we chose to perform exploratory factor analysis to compare the factor structure of coping in all three countries. Guided by the scree plots, we extracted four factors using the minimum residual method with oblimin rotation. Factor loadings under 0.25 were not considered. Each COPE score was assigned to the factor on which it loaded the highest, except acceptance in Peru, which loaded to an equal extent on three factors and was assigned to the factor of emotion-focused coping (see Results section and *Table 4c*).

The data analysis was executed in R, using the packages "emmeans" for estimated marginal means, and "psych" for factor analysis.

Results

The Frequency of COPE Responses Across the Three Countries

The summary statistics for the COPE scale scores are reported in *Table 3*. The most frequently reported coping behaviors were acceptance, active coping, planning, and positive reinterpretation, rated at the level of three points ("I do this quite a lot") in all three countries. The least frequently used coping behaviors in all countries were substance use, denial, behavioral disengagement, and religion, rated between one and two points ("I never do this" and "I do this a little"), except for religion in Peru. Peruvian participants scored religion well above two points (2.45). Another scale with low average score was self-blame, which rated about two points in Peru and was unavailable in the two other countries. The other COPE scales, such as emotional support, humor, instrumental support, mental disengagement, suppression of competing activities, and venting, yielded average scores of between two and three points ("I do this a little" and "I do this quite a lot").

The full model that included age, gender, country, and gender-by-country interaction explained under 20% of the total variability of the COPE scores. The model explained the least of the variability of instrumental support (2%) and most of the variability of religion (19.7%). The differences associated with age and gender of participants were under 5% of the total variability, with the least for mental disengagement (0.3%) and the most for venting (4.7%). Age differences were found for six COPE scales: older participants reported higher active coping ($\beta = 0.006$), planning ($\beta = 0.010$), religion ($\beta = 0.009$), and suppression of competing activities ($\beta = 0.007$), and lower mental disengagement ($\beta = -0.005$) and venting ($\beta = -0.006$), compared to younger participants. Gender differences were found for seven COPE scales: compared to male participants, female participants reported higher humor and self-blame, and lower denial, emotional support, instrumental support, religion, and venting (the marginal means are available from the corresponding author by request).

The degree of cross-cultural differences was captured by the variance by country after taking into account the age and gender of participants. *Figure 1* shows

the estimated marginal means of COPE scores in the three countries. Across the countries, participants differed the most in religion (17.7%), acceptance (15.8%), and mental disengagement (13.9%). For the other scales, the degree of differences across countries was under 7%. Compared to Russia and Kyrgyzstan, participants from Peru scored lower on behavioral disengagement, substance use, and venting, and higher on acceptance and mental disengagement. These scores did not differ between participants from Russia and Kyrgyzstan. Participants from Kyrgyzstan scored higher in denial than participants from Russia and Peru. The religion scores differed across all three countries: participants from Russia had the lowest score, participants from Kyrgyzstan had an intermediate score, and participants from Peru had the highest score.

Table 3

Descriptive statistics for COPE scales in the three countries

Scale	Russia		Kyrgyzstan		Peru	
	M	SD	M	SD	M	SD
Acceptance	2.90	0.64	2.75	0.64	3.41	0.53
Active coping	2.96	0.59	2.88	0.62	3.15	0.66
Behavioral disengagement	2.00	0.68	2.02	0.66	1.74	0.65
Denial	1.73	0.72	2.02	0.75	1.56	0.73
Emotional support	2.56	0.81	2.43	0.86	2.34	0.81
Humor	2.36	0.83	2.30	0.84	2.14	0.92
Instrumental support	2.37	0.84	2.34	0.83	2.35	0.78
Mental disengagement	2.42	0.59	2.41	0.60	2.94	0.70
Planning	2.98	0.68	2.95	0.72	3.02	0.62
Positive reinterpretation	2.81	0.81	2.82	0.82	3.00	0.70
Religion	1.49	0.72	2.03	0.98	2.45	0.97
Substance use	1.40	0.75	1.42	0.77	1.13	0.44
Suppression of competing activities	2.50	0.86	2.41	0.83	–	–
Venting	2.53	0.83	2.43	0.79	2.00	0.73
Self-blame	–	–	–	–	1.96	0.74

Note. M = mean score, SD = standard deviation

The statistically significant contribution of gender-by-country interaction was found for acceptance, suppression of competing activities, and venting scores. Female participants from Peru scored higher on acceptance than male participants, but no difference between male and female participants was found in Russia and Kyrgyzstan. Female participants from Kyrgyzstan scored higher on suppression of competing activities, but no difference between male and female participants was found in Russia (there was no data from Peru for this COPE scale). Male participants from Russia and Kyrgyzstan scored higher in venting than female partici-

pants, but no difference between male and female participants was found in Peru. Overall, the interaction accounted for at most 1.4% of total variability of COPE scores. The detailed account of the differences between the groups by country and gender is available upon request.
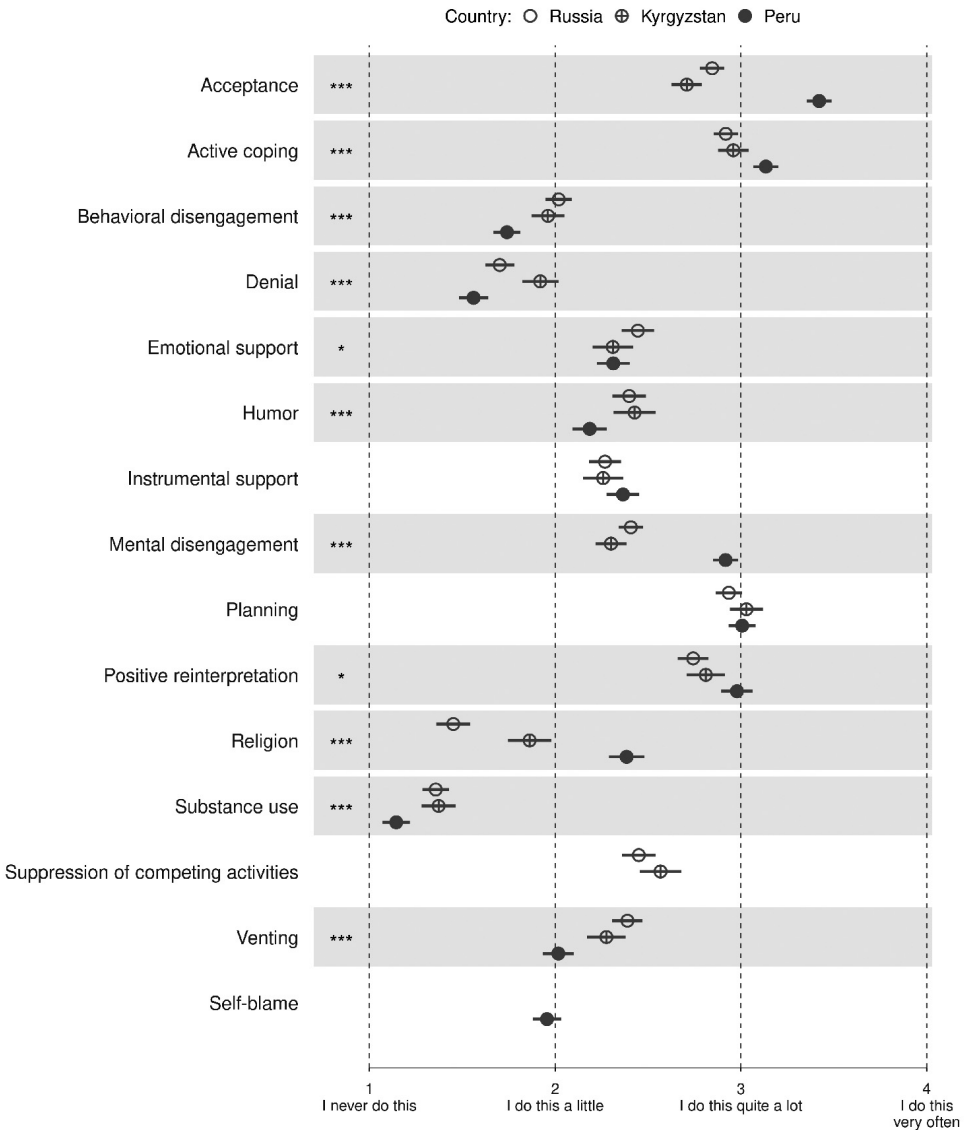

Figure 1. Estimated marginal means of COPE scores in Russia, Kyrgyzstan and Peru

Note. Error bars show 95% confidence intervals. Asterisks mark the statistical significance of country term: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. All thresholds were Bonferroni-adjusted by the number of models (15).

The Factor Structure of COPE Responses

The exploratory factor analysis of the COPE scores revealed that four factors explained 41.4% of the total variance in Russia, 40.8% in Kyrgyzstan, and 44% in Peru (*Table 4*). These four factors were problem-focused coping (F1), socially supported coping (F2), avoidant coping (F3), and emotion-focused coping (F4). All COPE scores loaded on at least one factor, except religion in Russia and substance use in Kyrgyzstan.

Problem-focused coping (F1) included active coping and planning in all three countries. In Russia and Kyrgyzstan, it was also associated with suppression of competing activities. In Peru, this factor included positive reinterpretation but not suppression of competing activities. In Kyrgyzstan, the factor of problem-focused coping (F1) was loaded negatively by behavioral disengagement.

The key variables for *socially supported coping (F2)* were emotional and instrumental support, which loaded on this factor in all three countries. In Russia and Kyrgyzstan, but not in Peru, this factor also included venting. In Peru, the factor of socially supported coping (F2) included emotional support, instrumental support, mental disengagement, and religion.

Denial was a key variable for *avoidant coping (F3)* in all three countries. In Russia, the avoidant coping factor also included mental disengagement, behavioral disengagement, and substance use. Similarly, in Peru this factor included behavioral disengagement and substance use as well as venting and self-blame. In Kyrgyzstan, avoidant coping (F3) included denial and religion.

Emotion-focused coping (F4) included humor and acceptance in all three countries; although, in Peru, acceptance loaded equally on the factors of problem-focused, avoidant, and emotion-focused coping. In Russia, this factor was also associated with positive reinterpretation; in Kyrgyzstan, with positive reinterpretation and mental disengagement.

The inter-factor correlations were similar in the Russian and Kyrgyz samples, ranging between 0.13 and 0.35, with the exception of the smaller correlations between avoidant coping (F3) and emotion-focused coping (F4) [0.03 in Russia and 0.06 in Kyrgyzstan]. Problem-focused coping (F1) correlated positively with socially supported coping (F2) [$r = 0.267$ and 0.205] and emotion-focused coping (F4) [$r = 0.348$ and 0.247] in Russia and Kyrgzystan, respectively. The avoidant coping (F3) correlated negatively with problem-focused coping (F1) [$r = -0.181$ and -0.154], but positively with socially supported coping (F2) [$r = 0.354$ and 0.304].

In the Peruvian sample, the inter-factor correlations were all positive and ranged between 0.01 and 0.33. Socially supported coping (F2) was positively associated with the factors of problem-focused coping (F1) [r = 0.326], and avoidant coping (F3) [$r = 0.246$]. The factor of emotion-focused coping (F4) was associated with the same two factors with weaker effect sizes [$r = 0.113$ and 0.162 for F1 and F3, respectively]. Two correlations were robust across all three samples: problem-focused with socially supported coping (F1 and F2), and socially supported with avoidant coping (F2 and F3).

Table 4

Exploratory factor analysis of COPE scales in three countries

(a) *Russia*

factor/item	F1	F2	F3	F4
F1 — Problem-focused coping				
Active coping	0.836			
Planning	0.683			
Suppression of competing activities	0.538			
F2 — Socially-supported coping				
Emotional support		0.864		
Instrumental support		0.760		
Venting		0.493		
F3 — Avoidant coping				
Mental disengagement			0.587	
Denial			0.563	
Behavioral disengagement	−0.318		0.411	
Substance use			0.255	
F4 — Emotion-focused coping				
Humor				0.636
Positive reinterpretation	0.272			0.522
Acceptance				0.393
Religion*				
Expl. var. (%)	13.5	12.4	7.8	7.7

Note. The loadings under 0.25 were filtered out.
* This scale was not related to any of the factors.

(b) *Kyrgyzstan*

factor/item	F1	F2	F3	F4
F1 — Problem-focused coping				
Planning	0.735			
Active coping	0.660			
Suppression of competing activities	0.355			
Behavioral disengagement	-0.446			
F2 — Socially supported coping				
Emotional support		0.836		
Instrumental support		0.788		
Venting		0.553		

factor/item				
F3 — Avoidant coping				
Denial			0.879	
Religion			0.359	
F4 — Emotion-focused coping				
Humor				0.569
Acceptance				0.556
Positive reinterpretation	0.389			0.425
Mental disengagement				0.365
Substance use*				
Expl. var. (%)	11.8	13.4	7.7	7.9

Note. The loadings under 0.25 were filtered out.
* This scale was not related to any of the factors.

(c) *Peru*

factor/item	F1	F2	F3	F4
F1 — Problem-focused coping				
Active coping	0.775			
Planning	0.773			
Positive reinterpretation	0.385			
F2 — Socially supported coping				
Emotional support		0.996		
Instrumental support		0.472		
Mental disengagement		0.363		
Religion		0.297		
F3 — Avoidant coping				
Denial			0.800	
Venting			0.548	0.274
Self-blame			0.467	0.307
Behavioral disengagement			0.364	
Substance use			0.257	
F4 — Emotion-focused coping				
Humor				0.603
Acceptance*	0.436		-0.347	0.381
Expl. var. (%)	13.4	11.8	11.7	7.1

Note. The loadings under 0.25 were filtered out.
* This scale was assigned to the factor of emotion-focused coping despite the fact that it was also associated with problem-focused and avoidant coping to the similar extent.

Discussion

We used data from Russia, Kyrgyzstan, and Peru to study cross-cultural differences in the prevalence and factor structure of coping strategies, as measured by Russian and Spanish adaptations of the COPE questionnaire. The scores on 15 COPE scales were used for cross-cultural comparison. Our results suggest that cross-cultural differences account for at most 20% of individual differences in coping responses, with religious coping, acceptance, and mental disengagement having the most variability across countries. Multiple coping responses were associated with the age and gender of the participants, with an overall effect under 5%. The four broad coping strategies — problem-focused, emotion-focused, socially supported, and avoidant — were reproduced in all three countries. At the same time, some coping behaviors were classified into different categories in different countries; for example, religious coping was classified as a socially supported strategy in Peru, and an avoidant-coping strategy in Kyrgyzstan. It was not classified into any strategic category in Russia.

Variability of coping behaviors within and between countries

We observed the full range of responses on every item of the COPE questionnaire, as well as a wide variability of COPE scores in all three countries. The difference between countries, including gender-by-country interaction, explained up to 18% of the variability of COPE scores, with a higher explained percentage of variance for religious coping (17.7%), acceptance (15.8%), and mental disengagement (13.9%). Other coping behaviors revealed almost no difference between countries, such as planning (0.5%), seeking emotional and instrumental support (1.1% and 1.0% respectively), suppression of competing activities (1.1%), and positive reinterpretation (1.3%).

The most prominent cross-cultural differences were observed in religious coping, which was the most common in Peru, less common in Kyrgyzstan, and the least common in Russia. We suggest that the high prevalence of religious coping in Peru can be explained by the fact that the Catholicism that is practiced by a majority of the Peruvian population (Instituto Nacional de Estadística e Informática, 2017) presents itself as a panacea for all worries, and it is a common practice in Peru to pray for relief from hardship and distress. In contrast, the religious practices of the Orthodox church, which is dominant in Russia (Pew Research Center, 2017) and Islam, which is dominant in Kyrgyzstan (Central Intelligence Agency, 2020), involve more of paying respect and devotion to spiritual beliefs and less of asking for support (Werth, 2011). However, religious coping is a complex construct that includes a variety of motivations and behaviors (Abu-Raiya & Pargament, 2015); the data from the COPE questionnaire do not allow drawing more detailed conclusions about the nature of the differences in religious coping that we observed.

Noticeable cross-cultural differences were found for coping by acceptance and coping by mental disengagement, both of which were higher in Peru than in Russia and Kyrgyzstan. In Peru, acceptance was the most used coping response, with over 90% of Peruvian participants reporting that they had accepted the reality of the lockdown and had been learning to live with it. Acceptance and distraction were considered as relatively effective strategies for coping with unavoidable stress

sources, such as acute or chronic pain and other health problems (Esteve et al., 2007; Kohl et al., 2013; Tamres et al., 2002).

We suggest that the critical trends in the COVID-19 infection and fatality rate, together with a strict lockdown, triggered a spike in the acceptance and disengagement coping responses in Peru. By the end of May 2020, when most of the data collection had been finished in all three countries, Peru had 148,285 confirmed cases and 4,230 deaths of COVID-19 per population of 33 million inhabitants (a fatality rate of 2.9%). Russia had 405,843 confirmed cases and 4,693 deaths per population of 144.5 million (a fatality rate of 1.2%). Kyrgyzstan had 1,748 confirmed cases and 16 deaths per population of 6.3 million (a fatality rate of 0.9%) (World Health Organization, 2020). Previous research has shown a strong negative association between disengagement coping and perceived control (Cassaretto et al., 2003; Dijkstra & Homan, 2016).

With the exception of religious coping, acceptance, and mental disengagement, the differences in coping responses across countries constituted only a small part of the total variability of coping. There have been only a few studies that compared the variability of coping within and between countries.

Gibson et al. (1992) compared coping behaviors reported by adolescents from 17 countries. The authors acknowledged that the adolescents from different countries reported similar problems and applied similar coping strategies. The most common coping response, regardless of country or socioeconomic grouping, was individual problem solving, such as trying harder or planning. Adolescents from Russia, treated as a separate group in the study and compared to adolescents from other countries, reported higher rates of trying harder as a response to the problems they met. A study of coping behaviors during COVID-19 in children and adolescents from Italy, Spain, and Portugal showed acceptance as the most prevalent coping strategy (Orgilés et al., 2020). The authors also found cross-cultural differences; the highest effect was found for collaborating with social activities, such as collective applause from the balconies that was a widespread expression of collective gratitude to health workers in Europe (Cramer's V = 0.22).

Four Broad Coping Strategies in Russia, Kyrgyzstan, and Peru

Our study reproduced the four broad dimensions of coping behavior that appeared in early studies of COPE (Litman, 2006 for the review), *i.e.,* problem-focused, emotion-focused, social support, and avoidant coping strategies. In all three countries, active coping and planning were considered as problem-focused strategies; acceptance and humor as emotion-focused strategies; emotional and instrumental support as socially supported strategies; and denial as an avoidant strategy. The factor structure that we observed in the Russian sample is close to the one reported by Litman (2006) on a sample of 230 undergraduate students from the United States, who rated their coping responses using 60-items COPE. In Litman's study, the four coping factors loaded on the same COPE scores, but explained more of their variance (over 79%). The patterns of inter-factor correlations were also reproduced in our study, with problem-focused, emotion-focused, and socially supported coping strategies more similar to each other than to avoidant coping.

Unlike Litman, however, we observed a relatively high correlation between avoidant and socially supported coping, and this coefficient was one of the two correlations reliably reproduced in all three countries in our study. We suggest that avoidant coping might play an important role in a coping response to the COVID-19 pandemic and home confinement. Similarly, Rasskazova et al. (2013) suggest that, despite being considered a maladaptive coping strategy, avoidant coping can be essential when a stressful problem has no practical solution.

Two coping responses — religious coping and mental disengagement — were classified into different coping dimensions in all three countries. Religious coping was not associated with any coping factor in Russia, but was associated with avoidance coping in Kyrgyzstan, and with socially supported coping in Peru. Mental disengagement was associated with avoidance coping in Russia, but with emotion-focused coping in Kyrgyzstan, and with socially supported coping in Peru. This result, together with a relatively large cross-cultural difference in these coping behaviors, suggests that some coping behaviors can take different roles within the system of response to stressful events. This is especially relevant for religious coping, which can include a variety of strategies: religious reappraisal, seeking support from the religious community, emotional regulation through prayer or meditation, and/or finding new purpose in life (Pargament et al., 2000). The COPE questionnaire captures only a small part of the variability of religious coping behaviors.

Implications for Further Investigation

Our study aimed to document rather than explain the differences in coping responses during the COVID-19 pandemic. The nature and the consequences of the differences revealed in the study need to be further investigated.

For example, the cultural and socio-economic nature of coping response can be studied in relation to the appraisal of the risk of COVID-19 (Huynh, 2020, Mertens et al., 2020) Just as in the latest research (Zacher & Rudolph, 2020, Orgilés et al., 2020), our study showed high prevalence of avoidant coping in response to COVID-19 pandemic. Avoidant coping is usually considered maladaptive in terms of subjective well-being (Benson, 2010; Bonneville-Roussy et al., 2017; Dijkstra & Homan, 2016; Klostermann et al., 2011; Litman, 2006; Penley et al., 2002; Woodhead et al., 2014). Further study is needed to clarify the role and function of avoidant coping response in the context of global pandemic and related home confinement.

Our research provided evidence of gender differences in coping responses. Female participants reported higher degrees of humor and self-blame, and male participants reported higher degrees of denial, religion, venting, and emotional and instrumental support. The pattern of gender differences varied across countries for some coping responses; for example, female participants from Peru reported higher acceptance than male participants, but no gender differences were found in Russia and Kyrgyzstan. Gender differences overall accounted for a small percentage of the individual differences in coping responses.

Nevertheless, we regard gender differences in coping responses important for further investigation. According to a meta-analysis, women generally are more engaged in coping behaviors due to higher stress appraisal (Tamres et al., 2002). A

qualitative study by Heltberg et al. (2013) showed that during global crises, women carry the additional burden of unpaid housework and meet harsher job conditions. In turn, Huang et al. (2020) reported that during the COVID-19 pandemic in China, women experienced more severe anxiety and fear than men.

Conclusion

Our study shows that, in general, participants from three different countries — Russia, Kyrgyzstan, and Peru — report a wide variety of coping behaviors in response to the COVID-19 pandemic and home confinement. The differences between countries are most pronounced in religious coping, acceptance, and mental disengagement, all of which are the highest in Peru.

Coping responses aggregate into four broad dimensions: problem-focused, socially supported, emotion-focused, and avoidant coping. While the core coping behaviors replicate across the countries, others can load on different dimensions in different countries. Religious coping and mental disengagement were classified into different dimensions in all three countries. We attribute the differences in the prevalence of coping behaviors and their factor structure to cultural features (*e.g.*, dominant religion and religious practices) and the specific conditions of the COVID-19 epidemic and lockdown in a country. Our results contribute to the collection of knowledge of individual responses to the COVID-19 pandemic around the world, and hopefully will aid the search for universal and culture-specific resources for coping with the consequences of the pandemic.

Limitations

The generalizability of our results is limited by the fact that most of our participants in all three countries were university students. It is possible that the occurrence of the reported coping behaviors is tied to specific aspects of the COVID-19 pandemic that students were exposed to, such as difficulties with learning online. For the same reason, behaviors associated with coping with caretaker stressors might be underrepresented.

Our study relied on self-reports of coping behaviors, and therefore might be subject to social desirability bias, especially the responses on substance use and religious coping. Another possible concern is that in the Russian and Kyrgyz samples, we used an abbreviated version of the COPE questionnaire that has never been used before. The reliability indices of the abbreviated COPE scales in Russian and Kyrgyz sub-samples were comparable to those achieved in Peru using the Spanish Brief COPE and were similar to the reliabilities reported in a big meta-analysis (Kato et al., 2015). We also suggest that the similarity in broad dimensions of coping yielded in Russia, Kyrgyzstan, and Peru supports the notion that similar constructs were measured in all three sub-samples.

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Mental Health and the COVID-19 Pandemic: Hardiness and Meaningfulness Reduce Negative Effects on Psychological Well-Being

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Background. The COVID-19 outbreak and the measures taken to curb it have changed people's lives and affected their psychological well-being. Many studies have shown that hardiness has reduced the adverse effects of stressors, but this has not been researched in the Russian COVID-19 situation yet.

Objective. To assess the role of hardiness and meaningfulness as resources to cope with stress and minimize its effects on psychological well-being.

Design. The study was conducted March 24–May 15, 2020 on a sample of 949 people (76.7% women), aged 18–66 years (M = 30.55, Me = 27, SD = 11.03). The data was divided into four time-periods, cut off by the dates of significant decisions by the Russian authorities concerning the COVID-19 pandemic. The questionnaires were: Beck Anxiety and Depression Inventories, Symptom Check-list-90-R, Noetic Orientations Test, and Personal Views Survey-III.

Results. Welch's ANOVA showed significant differences between the time-periods in meaningfulness, hardiness, anxiety, depression, and the General Symptomatic Index (GSI) (W = 4.899, $p < 0.01$; W = 3.173, $p < 0.05$; W = 8.096, $p < 0.01$; W = 3.244, $p < 0.022$; and W = 4.899, $p < 0.01$, respectively). General linear models for anxiety, depression, and GSI showed that biological sex, chronic diseases, self-assessed fears, and hardiness contributed to all of them. In all three models, hardiness had the most significant impact. Anxiety was also influenced by the time factor, both in itself and in its interaction with hardiness levels. With less hardiness, more anxiety occurred over time.

Conclusion. Hardiness was shown to be a personal adaptive resource in stressful situations related to the COVID-19 pandemic.

Introduction

As of the middle of 2020, the COVID-19 pandemic has radically changed the daily lives of people worldwide. These changes cannot be explained only by the direct threat posed by this disease to people's health or the health of their relatives. The measures that were taken by governments and health organizations to slow down and combat the pandemic also significantly affected the lives of many. Any significant change in everyday routine induces stress and thus requires adaptational resources to deal with it. A recent review of the quarantine's psychological effects concluded that people could suffer from mental disorders such as traumatic stress, low mood, and depression (Brooks et al., 2020).

To date, more than 400 studies have examined mental health issues in the global pandemic situation. There are systematic reviews on this topic, reporting that the risk of mental disorders increased significantly compared to the pre-outbreak period (Rajkumar, 2020). However, one study reported no significant changes in anxiety, depression, and stress indicators at different stages of the ongoing epidemic. The rates were the same early in the epidemic process, when the number of cases was growing, and later, when the epidemic declined, and the number of people who had recovered prevailed. However, it should be kept in mind that the pandemic might have long-term effects, as was the case after previous massive epidemics (Peng et al., 2010).

We can point out two main groups of factors that have led to psychological changes and stress-reactions during the COVID-19 pandemic. The first group includes real risks of getting sick and people's fears for their physical health and the health of their loved ones. Those fears are related to risk assessment. At the beginning of the COVID-19 pandemic, health risks were unpredictable and could not be calculated based on official information or personal experience. Later the number of cases worldwide increased significantly, several famous people became infected with COVID-19, and the media began to show patients with the disease. Along with the possible occurrence of cases among acquaintances, all of those factors probably increased the subjective perception of risk due to the availability heuristic (Kahneman, Slovic, & Tversky, 1982).

Later, most people experienced significant changes introduced to their daily lives due to the pandemic. An enforced "vacation" resulted in a decrease or even a complete loss of income; some people lost their jobs or businesses. Economic shocks tend to be detrimental to psychological well-being, causing mental disorders, and increasing anxiety and depression on their own (Catalano et al., 2011). A compelled reduction or sometimes complete cessation of social contacts and personal communication is also a considerable stress factor associated with negative consequences for mental health (Wang et al., 2017). The restriction of social contact reduces the possibility of social support in a difficult situation, increasing the psychological consequences (Taylor, 2011; Viseu et al., 2018). In addition to limited interpersonal communication, restrictions on public life made many people lose access to their usual hobbies and places of interest, such as sports, theaters, and concerts.

Health-related fear, a decrease in social support availability, and the absence of the usual recreational activities have increasingly placed demands on psychological stability and the ability to cope with stressful situations during the COV-

ID-19 pandemic. Coping with stress is possible through various internal mental resources, such as hardiness and meaningfulness. *Hardiness* is a pattern of attitudes towards the world, the ability to actively engage in relationships with it in any circumstances, to find constructive and valuable aspects in what is happening (Maddi & Khoshaba, 2005). *Meaningfulness* includes experiencing one's own life as meaningful and oneself as having control over it.

Hardiness has traditionally been viewed in the context of resilience to stress factors (Eschleman, Bowling, & Alarcon, 2010). For example, higher hardiness was associated with a lower level of perceived stress among rescuers (Jamal, Zahra, Yaseen, & Nasreen, 2017), and with lower posttraumatic stress disorder symptoms in military personnel (Thomassen, Hystad, Johnsen, Johnsen, & Bartone, 2018). Hardiness here possibly acts as a buffer, mitigating the negative impact of other factors on stress levels. For example, in Malaysian undergraduate students, poor problem-solving was generally associated with stress, but this stress was lower in students with higher hardiness (Abdollahi et al., 2016).

Numerous studies have linked hardiness to depression. Police officers with higher hardiness levels showed lower depression scores than their less resilient colleagues (Allison et al., 2019). The same results were demonstrated for US National Guard soldiers who returned after a one-year deployment to Afghanistan (Bartone, & Homish, 2020).

Hardiness prevents the deterioration of psychological well-being in stressful situations and becomes a good predictor of performance. For example, cadets' job performance was predicted by their hardiness levels (Maddi et al., 2017; Nordmo et al., 2020). It may also be a buffer that reduces negative impacts on productivity, such as poor sleep quality, which was also observed in the sample of naval cadets (Nordmo et al., 2020).

According to many studies (e.g., Park et al., 2020), the feeling of life's meaningfulness is also a predictor of low levels of depression. The lack of a feeling of meaning in life is not just a consequence or correlate of depression, but rather a reason for its development and continuation (Goodman, Doorley, & Kashdan, 2018).

Higher meaningfulness in life is associated with lower levels of stress indicators as well (Allan, Douglass, Duffy, & McCarty, 2016; Wang, Koenig, Ma, & Al Shohaib, 2016; Park & Baumeister, 2017). Experiencing life as meaningful can protect from the negative impact of harmful events, such as war (Blackburn, & Owens, 2015; Currier, Holland, & Malott, 2015) or being a victim of sexual violence (Gross, Laws, Park, Hoff, & Hoffmire, 2019), by lowering stress disorder, depression, and suicidal thoughts. A recent review of the relationship between well-being and psychopathological symptoms found that meaningfulness contributed to greater resistance to emotional difficulties and traumatic events (Goodman et al., 2018).

Several studies also noted a connection between meaningfulness of life and lower levels of anxiety, including health-related anxiety (Yek, Olendzki, Kekecs, Patterson, & Elkins, 2017). For example, meaningfulness in life acts as a buffer between anxious feelings and experiential avoidance (unwillingness to remain in contact with aversive thoughts) (Kelso, Kashdan, Imamoğlu, & Ashraf, 2020).

This study aimed to assess how psychological well-being (the severity of symptoms of anxiety, depression, and the overall severity of psychopathological symptoms) changed in the situation of the COVID-19 pandemic and related everyday

life changes. We also aimed to evaluate the role of several socio-demographic factors and individual characteristics (hardiness and meaningfulness) in the severity of psychopathological symptoms accompanying changes in the pandemic situation.

We hypothesized that high levels of hardiness and meaningfulness were associated with less severe symptoms of anxiety, depression, and the general symptomatic index (GSI) during the COVID-19 outbreak in Russia in the first half of 2020.

Methods

Participants

The sample consisted of 949 voluntary respondents (76.7% female), aged 18–66 years (mean age 30.55, median age 27, standard deviation 11.03) who participated in anonymous online research (Google Forms). The invitations were shared via social networks and in news articles on specialized psychological resources. The questionnaires were preceded by an informed consent form describing the research, data storage and processing conditions, and other ethical considerations. Only the data from participants who gave their informed consent was stored and used for further analysis. The participants were able to submit an optional feedback request after completing the form and were later provided with personal feedback.

Materials

Questionnaires

1. The Beck Anxiety Inventory (BAI) (Steer, & Beck, 1997) in a Russian adaptation by Tarabrina (2001).
2. The Beck Depression Inventory-II (BDI-II) (Beck, Steer, & Brown, 1996) in a Russian adaptation by Tarabrina (2001).
3. The Symptom Check-list-90-R (SCL-90-R) (Derogatis, & Savitz, 1999) in a Russian adaptation by Tarabrina (2001).
4. Noetic Orientations Test (NOT) (Leontiev, 2000). The global scale of this questionnaire description is very similar to our understanding of meaningfulness, as discussed above. The general NOT score is the only measurement from this method that we used in the current analysis, and it will be referred to as "meaningfulness" later on.
5. Personal Views Survey III (PVS-III-R) (Maddi & Khoshaba, 2001) in a Russian adaptation by Leontiev and Rasskazova (2006).
6. A socio-demographic survey, which included questions on how the COVID-19 pandemic affected the respondents' lives, their main fears associated with the pandemic, what precautionary measures were taken, etc.

Procedure

The data was gathered online via Google Forms from March 24 to May 15, 2020.

The study began at a time when the official statistics in Russia were reporting no more than 100 new cases of COVID-19 per day, but traveling outside the country was already restricted significantly. Russian citizens coming from abroad and

vulnerable groups (older people and people with chronic diseases) were put on self-isolation or institutionally quarantined; universities received recommendations to use distance education.

The first milestone for this study was on March 25, when the first week of paid days off was announced in Russia due to the progressive spread of the coronavirus. By that time, our data had been gathered for more than 24 hours. This was the first time that epidemic measures affected most of the country's population, and the spread of the infection exceeded 100 new cases per day.

The second milestone was on April 2, related to the official announcement that non-working days were extended until the end of April (nine days into our data collection process). However, most people suspected that this "vacation" would continue until the end of the regular Russian May holidays (May 1, May 2, and May 9). By this point, it was clear that the pandemic-related changes would be lasting and require corresponding lifestyle changes.

The third milestone was the beginning of the long period of obligatory self-isolation (April 6, 13 days after the start of the research). By that time, people county-wide were transitioning to the remote format of work and education and had begun to adapt to this new reality. The infection in the country reached 1,000 new cases per day.

We divided all the collected data into four intervals (periods) to assess the dynamics of psychological well-being over time:

1. Period I (P I): March 24 — March 25, 88 data sets.
2. Period II (P II): March 26 — April 2, 262 data sets.
3. Period III (P III): April 3 — April 6, 296 data sets.
4. Period IV (P IV): April 7 — May 15, 303 data sets.

Results

Not all the questionnaires and scales showed normal distribution of the results, which influenced the choice of statistical methods, explained below for each case.

Table 1 presents the descriptive statistics for the total amount of the data sets and the four identified periods.

Table 1

Descriptive statistics by period

	P I (n=88)		P II (n=262)		P III (n=296)		P IV (n=303)		Total (n=949)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Meaningfulness (NOT)	100.39	18.58	95.00	19.10	93.36	20.17	91.67	21.96	93.92	20.45
Hardiness (PSV III)	78.48	20.87	76.43	20.24	74.72	20.79	71.80	23.10	74.61	21.50
Depression (BDI)	10.15	8.95	11.18	8.98	12.69	9.77	12.89	10.19	12.10	9.65
Anxiety (BAI)	5.33	9.12	8.19	8.37	10.10	9.64	10.16	10.34	9.15	9.60
GSI (SCL-90-R)	0.56	0.53	0.57	0.51	0.68	0.54	0.73	0.63	0.65	0.56

Table 1 shows that all psychological distress indicators (anxiety, depression, and SCL's general symptomatic index, GSI) increased over time. Hardiness and meaningfulness scores decreased through the time-periods.

ANOVA was used to verify the significance of those differences. Due to non-normal distribution of some results, the inequality of the groups and the inequality of intra-group variances, Welch's test (Welch's ANOVA) was used instead of Fisher's ANOVA, as it showed the best robustness against all those data specifics (Delacre, Lakens, Mora & Leys, 2019). Multiple comparisons were made using Bonferroni correction (for hardiness and meaningfulness, as those scales had equal variances) and Tamhane's T2 all-pairs comparison test for the remaining scales, which had different variances. The results are shown in *Table 2*.

Table 2

ANOVA results

		Sum of squares	df	Mean square	Welch	Sig.	Post hoc
NOT	Between groups	5616.019	3	1872.006	4.899	0.002	P III>P I
	Within groups	390920.518	945	413.673			P IV>P I
	Total	396536.537	948				
Hardiness	Between groups	4585.720	3	1528.573	3.173	0.024	-
	Within groups	433526.674	945	458.758			
	Total	438112.394	948				
Anxiety	Between groups	2103.416	3	701.139	8.096	0.000	P III>P I
	Within groups	85194.635	945	90.153			P IV>P I
	Total	87298.051	948				
Depression	Between groups	851.675	3	283.892	3.244	0.022	-
	Within groups	87497.815	945	92.590			
	Total	88349.490	948				
GSI	Between groups	4.701	3	1.567	5.077	0.002	P IV>P II
	Within groups	296.977	945	0.314			
	Total	301.678	948				

Thus, significant differences between the time-periods were only shown for anxiety, meaningfulness, and GSI.

Then, we calculated Spearman's rank correlation coefficients to assess the relationships between the measured indicators. Non-parametric correlation was used due to the non-normal distribution of the data. The results are presented in *Table 3*.

As seen in Table 3, all indicators of symptom severity correlated negatively with hardiness and the NOT score.

Our next step was to build general linear models (GLM) for anxiety, depression, and GSI. Those models included the following factors: socio-demographic indicators, self-assessed fears, preferred sources of information, trust in different

sources of information, hardiness, and meaningfulness. The last two were grouped into low, medium, and high scores, based on reference values obtained in Russian-sample adaptations of the questionnaires.

Table 3

Correlations between scales

	NOT	Hardiness	Depression	Anxiety
1. NOT	–			
2. Hardiness (PSV III)	0.793[**]	–		
3. Depression (BDI)	–0.568[**]	–0.681[**]	–	
4. Anxiety (BAI)	–0.302[**]	–0.410[**]	0.590[**]	–
5. GSI (SCL-90-R)	–0.457[**]	–0.610[**]	0.760[**]	0.716[**]

Note. ** p-value < 0.01; $n = 949$

One of our assumptions was that hardiness and meaningfulness participated as adaptational resources in stressful situations, helping people to cope better with anxiety, depression, and other psychopathological symptoms. We expected that an increase in symptoms would be mitigated with higher rates of hardiness and meaningfulness over time. Therefore, the interaction of those factors with the time-periods was included in the model.

Table 4

General linear model for anxiety (BAI)

	Sum of squares	df	Mean square	F	Sig.	Partial Eta squared
Corrected model	22398.569	21	1066.599	15.235	0.000	0.257
Intercept	14045.896	1	14045.896	200.626	0.000	0.178
Sex	1010.192	1	1010.192	14.429	0.000	0.015
Chronic diseases	1765.572	1	1765.572	25.219	0.000	0.026
Fear for own health	2252.850	4	563.213	8.045	0.000	0.034
Fear for relatives' health	987.619	4	246.905	3.527	0.007	0.015
Hardiness (PSV III)	5391.890	2	2695.945	38.508	0.000	0.077
Period	1592.761	3	530.920	7.583	0.000	0.024
Hardiness × Period	935.401	6	155.900	2.227	0.039	0.014
Error	64899.481	927	70.010			
Total	166726.000	949				
Corrected total	87298.051	948				

Table 4 shows the resulting model for anxiety (BAI). Factors that did not have statistically significant effects were excluded from the model.

As shown in Table 4, anxiety levels varied depending on the participant's sex, presence of chronic diseases, and declared fears for one's health and the health of loved ones. Anxiety also increased over time. The most significant effect was observed from hardiness, while a statistically significant effect was observed from the interaction of hardiness and time-period (for better visual representation, see *Figure 1*). We failed to find a significant contribution of meaningfulness to the dynamics of anxiety in this model.
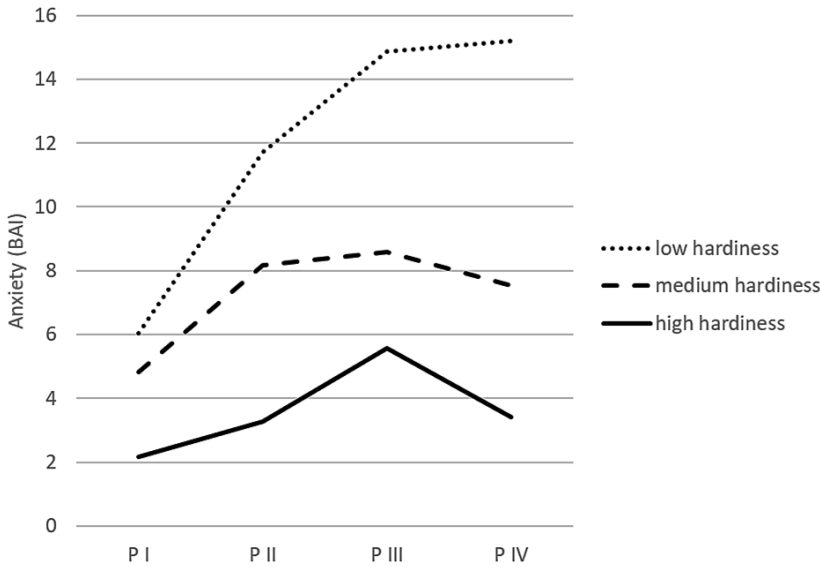
Figure 1. Interaction between hardiness and time in relation to anxiety

Figure 1 shows that individuals with a low level of hardiness were characterized by an increase in anxiety over the four observation periods. In people with medium or high hardiness, anxiety grew from the 1st to the 3rd periods, but fell during the 4th period.

The general linear model for depression is presented in *Table 5*.

Women showed higher depression than men, and people with chronic diseases showed higher depression than those with no chronic illnesses. Respondents who lived in regions with reported cases of COVID-19 were also more likely to exhibit higher depression. Subjective fears for the health of relatives and fears that socio-economic conditions would worsen were also associated with the depression scores. Hardiness, as in the previous model, was shown to reduce the severity of depression, and a significant effect of meaningfulness was observed: It also decreased the symptoms of depression.

Occupation and regime of work (distance or other) played a significant role in the level of depression. For statistical data, see *Table 6*.

Table 5

General linear model for depression (BDI)

	Sum of squares	df	Mean square	F	Sig.	Partial Eta squared
Corrected model	36324.638	20	1816.232	32.397	0.000	0.411
Intercept	15689.805	1	15689.805	279.869	0.000	0.232
Sex	449.901	1	449.901	8.025	0.005	0.009
Chronic diseases	442.488	1	442.488	7.893	0.005	0.008
COVID-19 cases nearby	436.358	1	436.358	7.784	0.005	0.008
Fear for relative's health	857.119	4	214.280	3.822	0.004	0.016
Socioeconomic fear	986.463	4	246.616	4.399	0.002	0.019
Occupation	644.443	3	214.814	3.832	0.010	0.012
Type of work	433.275	2	216.638	3.864	0.021	0.008
Hardiness (PSV III)	7985.785	2	3992.893	71.224	0.000	0.133
Meaningfulness (NOT)	2456.727	2	1228.364	21.911	0.000	0.045
Error	52024.852	928	56.061			
Total	227295.000	949				
Corrected total	88349.490	948				

Table 6

Tukey's range test results (multiple comparisons) for the regime of work and occupation

(I)		Mean difference (I–J)	Std. error	Sig.	95% CI	
					Lower bound	Upper bound
Occupation L	W&L	2.7510	1.01498	0.034	0.1388	5.3633
Regime of work R	SI/Q	2.8327	0.85074	0.003	0.8356	4.8298
	D	1.9462	0.53396	0.001	0.6927	3.1996

Note. Occupation types: L — currently learning, W — currently working, W&L — currently working and learning, N — currently not working or learning; Regime of work: SI/Q — currently on self-isolation or quarantine, D — currently working or learning distantly, R — currently working or learning in usual format (non-distant). Only significant differences are listed.

Table 6 shows that higher rates of depression were seen in the participants whose main activity was learning (basically, non-working students), compared to those who were studying and working simultaneously. Those who were working full-time showed higher depression scores in comparison to those who were in quarantine and self-isolation or working from home.

Table 7

General linear model for GSI (SCL-90-R)

	Sum of squares	df	Mean square	F	Sig.	Partial Eta squared
Corrected model	113.58	17	6.681	33.069	0.000	0.376
Intercept	43.294	1	43.294	214.287	0.000	0.187
Sex	3.482	1	3.482	17.235	0.000	0.018
Chronic diseases	1.682	1	1.682	8.325	0.004	0.009
COVID-19 cases near	1.796	1	1.796	8.890	0.003	0.009
Fear for own health	3.698	4	0.924	4.575	0.001	0.019
Fear for relatives' health	2.834	4	0.709	3.507	0.007	0.015
Socioeconomic fear	2.952	4	0.738	3.652	0.006	0.015
Hardiness (PSV III)	74.371	2	37.185	184.050	0.000	0.283
Error	188.098	931	0.202			
Total	708.378	949				
Corrected total	301.678	948				

Table 7 shows the general linear model for the GSI indicator of the SCL-90-R.

Women showed a higher general symptomatic index than men, and people with chronic diseases showed a higher GSI than those with no chronic illnesses. Respondents who lived in regions with reported cases of COVID-19 were also more likely to exhibit a higher general symptomatic index. Subjective fears (for one's health, for the health of loved ones, of worsening socio-economic status) were positively associated with the general symptom severity index. Thus, the GSI in our sample behaved much like the depression score. Hardiness (as in the two previous models) demonstrated the most pronounced effect on the general symptom severity index. Meaningfulness showed no statistically significant effect in this model.

To assess the influence of biological sex, chronic diseases, and the presence of COVID-19 cases in the respondent's region on the dynamics of the GSI, samples from the four periods were compared using the Chi-square test. There were no differences in the proportion of respondents with chronic diseases. There were more men in the samples of the second and third periods, and the largest share of respondents reporting the presence of COVID-19 cases in their region of residence was observed in the third period. Since men, on average, show less severe symptoms of anxiety, depression, and GSI than women, the observed increase of those indicators cannot be explained by sex only. As for the cases of COVID-19 in the respondent's locality, the levels of depression and GSI in the third period did not significantly differ from other periods, and therefore the contribution of this factor to the dynamics of symptoms can also be discounted.

Discussion

The study showed that anxiety, depression, and the general severity of psychopathological symptoms were negatively correlated with meaningfulness and hardiness. These results are consistent with previous findings of negative correlations between hardiness and anxiety, hardiness and depression (Allison et al., 2019; Bartone, & Homish, 2020); meaningfulness and anxiety, meaningfulness and depression (Park et al., 2020; Yek et al., 2017), while both hardiness and meaningfulness were negatively correlated with mental health issues in general (Eschleman et al., 2010; Goodman et al., 2018).

All measurements were changing during the four periods of the COVID-19 pandemic reaction process in Russia. However, multiple comparisons showed statistically significant dynamics of meaningfulness, anxiety, and GSI only. Meaningfulness dynamics can be explained via the following example. An unforeseen, extremely unpredictable and stressful situation dramatically changes one's everyday life, disrupts plans, and forces people to reconsider life goals and look for new ways to achieve them, to revise their views about life in general. The restrictive measures introduced during the COVID-19 pandemic put most people in challenging situations. Many had to learn new ways to carry out their professional activities; some could not work remotely and had to look for new sources of income. Thus, the emerging obstacles and general uncertainty about the future provoked anxiety and exacerbated existing problems, as evidenced by the increase in anxiety scores and the GSI.

As shown by general linear models, biological sex and chronic diseases were associated with higher scores in all three scales assessing the symptoms of psychological distress. The result seems predictable for people with chronic diseases, since they belong to the risk group for a severe COVID-19 scenario and consider the threat of infection higher. On the other hand, they faced restrictive measures earlier, and by the time they completed our survey, they had been self-isolating for an extended period. Women are generally known to be more susceptible to anxiety and depression (see, for example, Afifi, 2007; Rosenfield, & Mouzon, 2013). The severity of symptoms (GSI) varied for people declaring different levels of fears, related to both health and socio-economic status. The increase of health-related fears was associated with higher anxiety, depression, and the general severity of symptoms, while socio-economic fears were linked to depression and GSI. The negative correlation between the NOT scale and the levels of depression is also consistent with other studies (e.g., Goodman et al., 2018).

In our opinion, the most interesting finding of this study was the contribution of hardiness to the dynamics of anxiety. Higher hardiness rates were associated with a decrease in symptoms across all clinical scales. Simultaneously, the contribution of the hardiness indicator to the dynamics of anxiety over time was observed. People with lower hardiness showed anxiety increasing over time, while in people with medium to high hardiness, no significant rise in anxiety was found. That interesting dynamic could not be explained by hardiness changing over time, since no statistically significant differences were detected. These results confirm previously obtained data on hardiness as an adaptational resource under stress (Eschleman et al., 2010; Leontiev & Rasskazova, 2006; Maddi et al., 2017; Nordmo et al., 2020).

However, meaningfulness did not impact the dynamics of psychological well-being, anxiety, depression, and general symptoms. Yet, higher meaningfulness in life was associated with less severe depression symptoms, with no apparent connection to the time factor.

Conclusion

The COVID-19 pandemic and preventive measures significantly changed the daily lives of many people in Russia. Our study showed that those changes were accompanied by an increase in anxiety, depression, and other mental disorders. However, the severity of psychopathological symptoms was found to be moderated by internal personal resources, with hardiness being the core one. Numerous studies have investigated hardiness as the main factor in stress resistance, and our results were consistent with the whole body of research. In people with higher hardiness, an increase in anxiety in response to stressful events was relatively short-term, about two to three weeks. The anxiety levels then dropped, in contrast to people with lower hardiness, in whom anxiety due to the pandemic and measures to curb it continued to increase after more than a month.

In further studies, we plan to assess the severity of post-stress disorder symptoms. According to the data available, the symptoms of that disorder would also be less pronounced in people with higher hardiness.

Limitations

Our sample turned out to be significantly biased towards the prevalence of female participants. More than 50 percent of the sample was under 30 years old, which also limited the possibility of generalizing the results. Most of the participants were residents of large cities (Moscow, Kazan, St. Petersburg). While this reduces the possibility of extrapolating the results to the entire population, it also allows a better assessment of the psychological consequences of the pandemic and pandemic-related restrictive measures, since more cases of COVID-19 occurred and more restrictions were applied in large cities.

Our conclusions about the dynamics of psychological well-being are preliminary, since the scheme used to assess them was not based on repeated measurements. However, the comparison of samples from different periods showed that differences in levels of anxiety, depression, and GSI could not be explained by side variables only.

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The Psychological Impact of Six Weeks of Lockdown as a Consequence of COVID-19 and the Importance of Social Support: A Cross-Cultural Study Comparing Spanish and Russian Populations

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Background. The COVID-19 pandemic has been an unprecedented social and health emergency worldwide. Cross-cultural research on mental health during this situation is needed to better understand its consequences.

Objective. To evaluate the different psychological impacts of the crisis and lockdown situation during the first six weeks of COVID emergency measures in samples of the Spanish and Russian populations.

Design. A cross-sectional study was conducted through an online survey ($N_{Spain} = 1041$; $N_{Russia} = 743$). The prevalence of loneliness, depression, anxiety, perceived discrimination (PD), internalized stigma (IS), and perceived social support (PSS) was evaluated. Chi-square tests and t-tests were administered. The Enter Method were used to identify the predictors of the mental health impact.

Results. Differences were found between the Russian and the Spanish populations. While the degrees of anxiety and depression did not differ significantly, loneliness, the alienation dimension of IS, and PD were more pronounced in the Russian respondents. In Spain, the predictor of less negative impact was PSS from various sources, while in Russia we only found PSS from the family.

Conclusion. Although in both countries the impact at the clinical level seemed to be similar, differences were found at the psychosocial level. Variables with a strong cultural component may be key to determining the means of alleviating the effects of the crisis, with PSS being a fundamental protective factor. More cross-sectional studies are needed to understand the impact of the pandemic in depth.

Keywords: COVID-19; loneliness; mental health; perceived discrimination (PD); internalized stigma (IS); perceived social support (PSS)

Introduction

The alarm generated by COVID-19 has turned into a social and health emergency with political measures and consequences of unprecedented scope throughout the world. In both Spain and Russia, governments have adopted strict confinement measures for the population.

On March 14, 2020 a state of emergency was declared in Spain, and drastic quarantine measures were established for all Spanish citizens. First, citizens were confined to their homes for two weeks, during which time it was only possible to leave home for essential activities (shopping or going to work). The second two-week period was much more restrictive. From March 30 to April 12 there was a total suspension of all non-essential employment activity, which aggravated the already serious economic crisis.

On May 2, after seven weeks, the first steps were taken to partially lift the lockdown. The entire population was allowed to do contact-free sports or take a daily walk. They could be accompanied by only one person with whom they lived, or by a regular caregiver, and the activity had to be within a kilometer of their home. Two months after Spain began the lockdown, the pandemic began to recede, and in half the country the lockdown began to be lifted. After almost 100 days of confinement, Spain already had 246,752 cases, including 28,325 confirmed deaths and more than 150,376 recovered (Ministry of Health, 2020).

In Russia, COVID-19 first broke out on January 31, 2020. In February and March, the first containment measures were introduced by the state administration, with restrictions on the entry of foreign citizens and stateless persons into the country. In his address to the nation on March 25, the President of Russia announced a non-working period from March 30 to April 3 in order to fight the spread of the disease. On March 30, a self-isolation order and restrictions on the movements of Russian citizens were introduced. The order allowed citizens to leave their homes only for valid reasons (which differed slightly from region to region), such as essential workers traveling to work, or individuals going to a pharmacy or the nearest grocery store. Outdoor activities were forbidden for everyone, except for walking pets at no more than 100 meters from the place of residence. The mandatory distance of 1.5 meters between individuals and the mandatory wearing of masks and gloves in public places were also implemented.

As of the start of this study (May 11, 2020) 221,344 cases of coronavirus had been identified in 85 regions of the Russian Federation, according to Rospotrebnadzor (Federal Service for the Oversight of Consumer Protection and Welfare). By this time there were 2,009 registered COVID-19 deaths and 39,801 recoveries (Federal Service for the Oversight of Consumer Protection and Welfare, 2020). After two and a half months of confinement, on June 14, 2020, a gradual lifting of restrictions began. Thus, at the beginning of our study, the numbers of registered cases of infection in Spain and in Russia were approximately comparable, while the number of COVID-19 losses in Spain was 14 times higher than the number of deaths in Russia.

The impact on the population's mental health of pre-Covid-19 quarantines is established; however, there have been few large-scale studies providing significant evidence to account for the effects of quarantine, probably due to the uniqueness of each situation.

In a recent review, Brooks et al. (2020) included 24 studies that addressed the negative effects of quarantine on mental health. Among the major diseases that have led to some form of quarantine in recent years are Severe Acute Respiratory Syndrome (SARS) and Ebola, although the length of the quarantine is unclear in several studies (Blendon, Benson, DesRoches, Raleigh, & Taylor-Clark, 2004; Braunack-Mayer, Tooher, Collins, Street, & Marshall, 2013; Caleo et al., 2018; Liu et al., 2012; Marjanovic, Greenglass, & Coffey, 2007; Mihashi et al., 2009; Pan, Chang, & Yu, 2005; Sprang & Silman, 2013; Wu et al., 2009, n.d.; Yoon, Kim, Ko, & Lee, 2016), and ranges from one week to 21 days in others (Bai et al., 2004; Cava, Fay, Beanlands, McCay, & Wignall, 2005; Desclaux, Badji, Ndione, & Sow, 2017; Hawryluck et al., 2004; Maunder et al., 2003; Pellecchia, Crestani, Decroo, Van den Bergh, & Al-Kourdi, 2015; Robertson, Hershenfield, Grace, & Stewart, 2004; Wang et al., 2011; Wester & Giesecke, 2019; Wilken et al., 2017)

Various studies have indicated that quarantine is associated with increased psychological distress (Taylor, Agho, Stevens, & Raphael, 2008); diagnostic symptoms of post-traumatic stress disorder (PTSD) (Reynolds et al., 2008); depression (Hawryluck et al., 2004); greater levels of stress (DiGiovanni, Conley, Chiu, & Zaborski, 2004); insomnia, irritability, and low mood (Lee, Chan, Chau, Kwok, & Kleinman, 2005); and overall, emotions of fear, nervousness, sadness, and guilt (Reynolds et al., 2008). In a study which compared samples of people in quarantine with control groups, it was observed that psychological distress occurred in 34% of the population in quarantine, compared to 12% of the people who had not been isolated (Taylor et al., 2008). Another study which compared quarantined parents and children with a control group found that the prevalence of PTSD in quarantined parents was up to four times higher (28%) than in non-quarantined parents (6%) (Sprang & Silman, 2013).

One of the groups on which lockdowns have been found to have a great impact is health professionals, in whom acute stress, exhaustivity, irritability, insomnia, lack of concentration, and reduced performance in the workplace have been detected (Bai et al., 2004). Another study reported quarantine as a predictor of PTSD among hospital staff as much as three years later (Wu et al., 2009).

In addition, several factors can influence the effect the emergency and quarantine situation have in impacting mental health. The review by Brooks et al. in 2020 highlighted the following stressors: a long period of quarantine (Hawryluck et al., 2004; Reynolds et al., 2008); fear of infection (Bai et al., 2004; Cava et al., 2005; Desclaux et al., 2017; Hawryluck et al., 2004; Reynolds et al., 2008; Robertson et al., 2004); frustration and boredom; supply issues; and inadequate information (Blendon et al., 2004; Braunack-Mayer et al., 2013; Caleo et al., 2018; Cava et al., 2005; DiGiovanni et al., 2004; Pellecchia et al., 2015; Robertson et al., 2004; Wilken et al., 2017). As subsequent stressors, they pointed to financial losses (Maunder, 2004; Reynolds et al., 2008; Wester & Giesecke, 2019) and the stigma associated with the disease (Cava et al., 2005; Desclaux et al., 2017; DiGiovanni et al., 2004; Hawryluck et al., 2004; Pan et al., 2005; Pellecchia et al., 2015; Reynolds et al., 2008; Robertson et al., 2004; Y. Wang et al., 2011; Wester & Giesecke, 2019; Wilken et al., 2017).

This same review indicated that being a health worker (Reynolds et al., 2008), and having a previous record of mental health problems (Jeong et al., 2016), was

associated with greater psychological difficulties during quarantine. Contradictory results were found regarding other variables, such as age, education, or gender identity (Hawryluck et al., 2004; Taylor et al., 2008).

The impact of quarantine due to COVID-19 on perceived clinical and psychosocial variables seems obvious, with a significant number of studies from different countries now available showing the impact of the pandemic on increased clinical symptoms such as anxiety, depression, post-traumatic stress, and even suicides (González-Sanguino et al., 2020; Huang & Zhao, 2020; Mazza et al., 2020; Pappa et al., 2020; Tanoue et al., 2020; Voitsidis et al., 2020; Wang, Pan, Wan, Tan, Xu, Ho, et al., 2020a; Wang, Pan, Wan, Tan, Xu, McIntyre, et al., 2020b). Furthermore, these studies indicated that being a woman, a student, or presenting physical symptoms or a poor self-rated health status were predictors of a negative psychological impact caused by the situation.

Also of note were an increase in perceived loneliness due to confinement (Banerjee & Rai, 2020; Losada-Baltar et al., 2020), and an increase in the sense of stigmatization and discrimination associated with COVID-19 (He et al., 2020; Singh & Subedi, 2020).

Saltzman et al. (2020) note that after a disaster such as a pandemic, social support and community ties play a crucial protective role in mental health recovery. Wang et al. (2018) indicate that common mental health symptoms following pandemics are exacerbated by loneliness and lack of social support. Furthermore, different studies find that social support is a strong predictor of resilience after a disaster, favors positive adaptation (Hall et al., 2010; Saltzman et al., 2018; Xu & Ou, 2014), and provides protection against the effects of discrimination for different groups (Cristini, Scacchi, Perkins, Santinello, & Vieno, 2011; Seawell, Cutrona & Russell, 2014). Even in the context of COVID-19, it has been demonstrated that PSS reduces the psychological impact of this stressful situation (Lei, Huang, Zhang, Yang, Yang, & Xu, 2020).

Due to the negative consequences and the complexity of the situation resulting from the pandemic, it seems necessary to find methods that can help deal with the situation, such as social support, which empirical evidence has shown has positive effects on health, and serves as a protector in stressful situations (Cohen & Syme, 1985; Molina et al., 2008).

Despite the growing number of publications reporting similar experiences in different countries, there are few cross-sectional studies that allow direct comparison of responses to the pandemic in different nations. The present study aims to evaluate the different psychological impacts of the crisis and lockdown situations during the first six weeks of emergency measures in samples of the Spanish and Russian populations, in hopes of revealing the possible cultural and social aspects that may be mediating these impacts, with social support as a protective factor.

Methods

Our study took place from April 13 to April 27 in Spain (the population had been confined for 4-6 weeks at that time), and from May 7 to May 21 in Russia (the population had been confined for 5-7 weeks at that time). A survey developed by the Spanish team was to be completed online using the Google Forms platform,

with the aim of reaching the maximum population possible (since face-to-face interviews were not possible due to confinement, data had to be collected online). This survey was then translated into English and sent to the Russian team for translation. The study was approved in Spain by the Deontological Commission of the Faculty of Psychology of the Complutense University of Madrid (reference "pr_2019_20_029"), and in Russia by the Ethics Committee of the Faculty of Psychology at Lomonosov Moscow State University (reference No: 2020/37).

The evaluation protocol contained 70 items, and the average time for completion was about seven minutes. It also included a section with information about the research, as well as a consent form authorizing participation in the study and confirming acceptance of the laws regulating protection of personal data [(EU) 2016/679 of the European Parliament and of the Council of 27 April 2016].

Participants

In Spain, recruitment consisted of sending requests for participation to people in the databases of several different institutions: students and workers in public organizations such as the Complutense University of Madrid and the Chair for Stigma (www.contraelestigma.com), and private organizations such as the company Group 5. These databases are broad enough to provide a reasonable sampling of the Spanish population. To increase the sample size as much as possible, participants were asked to send the survey out by email or through various social networks (Twitter, WhatsApp lists, Facebook, etc.). The percentage of people recruited in this way was small, estimated at less than 5%.

In Russia, the study was conducted using *Testograph* ("Тестограф"), an online survey platform. Respondents were recruited via social networks (Facebook, VKontakte) and personal e-mail newsletters. The final sample, obtained through the snowball effect, was 1041 people in the Spanish sample, and 743 in the Russian sample, made up of the general population and various specific groups.

Inclusion criteria were: 1) being more than 18 years of age; and 2) living in Spain or Russia during the health emergency created by COVID-19.

Procedure

The variables and instruments included in the assessment were the following:

Sociodemographic variables: age (subsequently grouped into clusters 18-39, 40-59, 60-80); sex; relationship (single, a couple not sharing a living space, and a couple sharing a living space); educational level (elementary studies, high school, vocational training, university, postgraduate); profession (social-health, education, administration, commercial, and others, such as transport, communications, or tourism); employment situation (working, unemployed, student, retired, unpaid domestic work, other); economic situation (subjective perception from very bad to very good); importance of religious beliefs; and presence of a medical diagnosis (psychiatric and mental health problems, cardiovascular, neurological, respiratory, or other diseases).

Variables related to COVID-19: suffering from symptoms (yes, no); positive or negative diagnosis; hospital admission; existence or not of family members or close relatives who are infected; living with an infected person; perception of the

information received on the emergency (whether he/she felt he/she had sufficient information, or was overinformed); and work situation (obliged to go to his/her work center or able to work from home).

*Psychosocial variables***:** *Loneliness* was measured by the 3-item version of the UCLA Loneliness Scale (UCLA-3) (Russell, 1996). The three items in Likert-type format with three response options (1 = rarely, 2 = sometimes, 3 = often) adressed three dimensions of loneliness: relational connectedness, social connectedness, and self-perceived isolation. A single question on loneliness was also included (Campaign to End Loneliness, 2015): "For the past week, have you been feeling lonely?" Respondents were given the choice of 1 = hardly ever (less than 1 day); 2 = sometimes or a small part of the time (1–2 days); 3 = quite a long time (3–4 days); or 4 = all the time (5–7 days).

Perceived Intersectional Discrimination was evaluated by means of the Intersectional Day-to-Day Discrimination Index (InDI-D) (Scheim & Bauer, 2019). This scale provides a measure of the intersectional discrimination that can be caused by different conditions: sex, ethnicity, mental health diagnosis, and in this case, the presence of COVID-19. We used the main scale formed by 9 Likert-type items with four response options (1 = never to 4 = many times). The different questions evaluated the presence of intersectional discrimination from the beginning of the emergency generated by the coronavirus. The higher the score, the more discrimination suffered.

The emotional dimension of *Internalized stigma* (IS) was evaluated with one item adapted from the Internalized Stigma of Mental Illness (ISMI) (Ritsher et al., 2003), 1-alienation-item-ISMI (*"Since the emergency situation generated by the coronavirus, have you felt that the people who aren't in your situation can't understand you?"*).

Perceived social support (PSS) was evaluated by means of the Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet et al., 1988). The scale, made up of 12 Likert-type items with 7 response alternatives (1 = totally disagree to 7 = totally agree), evaluates the levels of perceived social support, identifying where the support comes from and how it is perceived.

Clinical variables: *Depression* was assessed through the Patient Health Questionnaire 2 (PHQ-2) (Kroenke et al., 2009). This brief self-report questionnaire addresses the frequency of depressive symptoms. It consists of two Likert-type questions with options ranging from 0 = never to 3 = every day. Higher scores indicate more symptomatology, providing a severity range of 0 to 6, and establishing the cut-off at >3 points as a possible case of depression (Muñoz-Navarro et al., 2017). *Anxiety* was measured through the Generalized Anxiety Disorder Scale (GAD-2) (Spitzer et al., 2006), which includes the first two items of the GAD-7 Likert format, with a maximum score of 6 points. The cut-off point in this case is 3, above which the possibility of detecting possible cases of anxiety is indicated (Muñoz-Navarro et al., 2017).

Analysis

Frequencies and percentages were calculated for the socio-demographic variables, and means with their confidence intervals (95%) were calculated for loneliness, depression, anxiety, discrimination, internalized stigma, and perceived social sup-

port variables. To compare the values obtained between the two countries, chi-square tests and t-tests were administered respectively. To identify the predictors of mental health disorders, the Enter method was used. The p-values of all tests were adjusted with the Bonferroni correction. Analysis and graphs were developed using R (v3.5.6) with the nlme package.

Results

Characteristics of Both Samples: Sociodemographic Composition and Variables Related to COVID-19

Both samples seemed equivalent in their sociodemographic composition, with a similar proportion of men and women (81% of women in Spain versus 84% in Russia; padj = 0.95). The average age of the samples was similar: 39.36 in Spain and 38.41 in Russia. Although in other variables the chi-square tests detected differences, these seemed to be minimal, and were due more to an excess of sensitivity due to the size of the sample; there were very similar percentages between both countries in marital status, couple status, employment situation, and age distribution.

The only noteworthy differences were in work situation, with a higher percentage of people working in Russia (72%) than in Spain (58%); marital status, with a higher percentage of single people in Spain (52% in Spain and 27% in Russia); and perceived economic situation, with 11% of the Spanish sample and 33% of the Russian sample considering it to be bad or very bad.

As for the variables of employment during COVID-19, COVID-19 symptoms, COVID-19 diagnosis, and living with someone infected, the two samples were equivalent. Differences in the composition of the two samples were found in the variables COVID-19 relative diagnosis and information received about COVID-19. *Table 1* shows the frequencies and percentages for the socio-demographic and Covid-19 related variables.

Table 1

Sociodemographic and Covid-19 related variables of the Spanish and Russian samples

		Spain (N, %)	Russia (N, %)	Padj
Sex	Male	202 (0.19)	116 (0.16)	0.945
	Female	841 (0.81)	615 (0.84)	
Marital status	Single	542 (0.52)	175 (0.27)	< 0.001***
	Married	386 (0.37)	343 (0.52)	
	Divorced	82 (0.08)	122 (0.19)	
	Separate	28 (0.03)	6 (0.01)	
	Widowed	7 (0.01)	13 (0.02)	
Relationship	Without partner	265 (0.25)	222 (0.31)	0.140
	Couple no sharing	195 (0.19)	105 (0.15)	
	Couple sharing	585 (0.56)	386 (0.54)	

		Spain (N, %)	Russia (N, %)	Padj
Education	Elementary	15 (0.01)	0 (0.00)	< 0.001***
	High school	149 (0.14)	83 (0.11)	
	Vocational training	125 (0.12)	0 (0.0)	
	University	401 (0.38)	554 (0.75)	
	Postgraduate (Master or PhD.)	355 (0.34)	59 (0.08)	
Work situation	Unemployed	92 (0.09)	79 (0.11)	< 0.001***
	Student	180 (0.17)	63 (0.09)	
	Working	604 (0.58)	522 (0.72)	
	Retired	48 (0.05)	36 (0.05)	
	Other	120 (0.11)	27 (0.04)	
Age	18–30	306 (0.29)	192 (0.26)	< 0.01**
	31–59	670 (0.64)	519 (0.71)	
	60–80	69 (0.07)	20 (0.03)	
Employment during COVID-19	Non applicable	427 (0.41)	286 (0.39)	1.000
	Face-to-face work	148 (0.14)	129 (0.18)	
	Work from home	470 (0.45)	316 (0.43)	
COVID-19 symptoms	No	836 (0.8)	615 (0.84)	0.438
	Yes	209 (0.2)	116 (0.16)	
COVID-19 diagnosis	No	1030 (0.99)	720 (0.98)	1.000
	Yes	15 (0.01)	11 (0.02)	
COVID-19 relative diagnosis	No	638 (0.61)	585 (0.8)	< 0.001***
	Yes	407 (0.39)	146 (0.2)	
Living with someone infected	No	1016 (0.97)	718 (0.98)	1.000
	Yes	29 (0.03)	13 (0.02)	
Information received about COVID-19	Not enough	184 (0.18)	367 (0.5)	< 0.001***
	Good	594 (0.57)	234 (0.32)	
	Overinformed	267 (0.26)	130 (0.18)	

* p < 0.05; ** p < 0.01; *** p < 0.001

Comparison on Clinical and Psychosocial Variables

The Spanish sample showed higher scores in depressive (PHQ-2) and anxiety symptoms (GAD-2), although these differences were not statistically significant. In relation to the psychosocial variables, the average scores on both the measures

of loneliness (single item on Loneliness and UCLA-3) and the stigma-related variables (perceived intersectional discrimination, measured by InDI-D, and internalized stigma, measured by ISMI) showed higher scores in the Russian sample. Regarding social support (EMAS), significantly higher scores were found in the Spanish sample overall and in all subscales. *Table 2* shows the means and their confidence intervals (95%) on the clinical and psychosocial variables. These results can also be observed in *Figure 1*.

Table 2

Means and their confidence intervals (95%) on clinical and psychosocial variables of the Spanish and Russian sample

|	Spain	Russia	padj
PHQ-2	1.81 (1.72;1.89)	1.62 (1.49;1.75)	0.254
GAD-2	1.8 (1.7;1.89)	1.77 (1.64;1.91)	1.000
UCLA-3	4.53 (4.43;4.63)	5.06 (4.92;5.21)	< 0.001***
Discrimination (InDI-D)	1.22 (1.09;1.34)	2.5 (2.28;2.73)	< 0.001***
Emotional internalized stigma (1-alienation-item-ISMI)	1.46 (1.34;1.49)	1.66 (1.7;1.65)	< 0.001***
MSPSS Friends	23.45 (23.15;23.75)	19.41 (18.97;19.84)	< 0.001***
MSPSS Family	23.22 (22.9;23.54)	21.37 (20.95;21.8)	< 0.001***
MSPSS Significant Others	23.95 (23.62;24.27)	21.05 (20.6;21.5)	< 0.001***
Social support (MSPSS Total)	70.62 (69.81;71.42)	61.83 (60.68;62.97)	< 0.001***
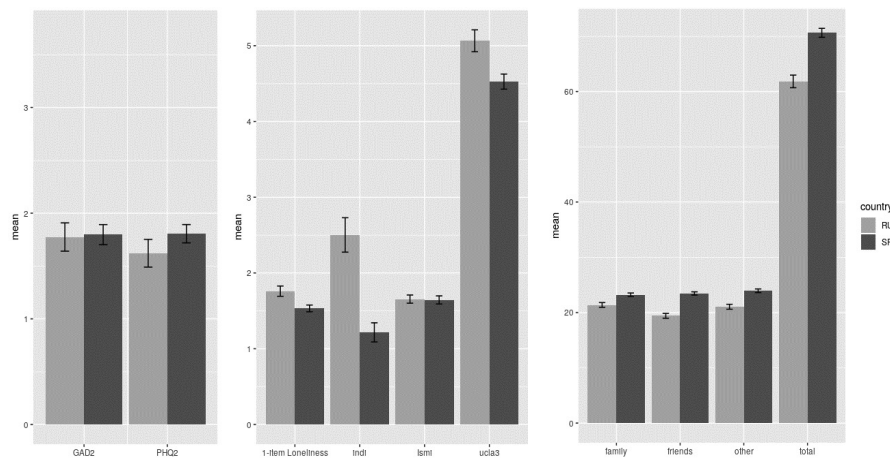
Figure 1. Differences between the Spanish and Russian samples in clinical and psychosocial variables

Table 3

Regression models of the dependence of the variables of perceived support from different sources

| | | Characteristics of the model | | | Regression model | | | | | | | | |
| | | | ANOVA | | Constant | | Significant others | | Family | | Friends | | |
		R	F	p	t	p	t	p	t	p	t	p	
Russia	Loneliness	0.311	26.0311	<0.001	25.761	<0.001***	-0.472	0.637	-3.797	<0.001***	-0.960	0.338	
	Depression	0.225	12.968	<0.001	11.610	<0.001***	-0.658	0.510	-4.030	<0.001***	1.084	0.279	
	Anxiety	0.298	23.551	<0.001	14.446	<0.001***	-0.745	0.457	-3.675	<0.001***	-0.714	0.476	
	Discrimination	0.239	14.637	<0.001	11.471	<0.001***	-1.132	0.258	-3.989	<0.001***	0.999	0.318	
	Emotional internalized stigma (1-alienation-item-ISMI)	0.252	16.413	<0.001	21.812	<0.001***	-1.370	0.171	-3.092	0.002**	-0.206	0.837	
Spain	Loneliness	0.474	100.317	<0.001	34.409	<0.001***	-3.222	0.001**	-5.285	<0.001***	-5.357	<0.001***	
	Depression	0.370	55.182	<0.001	19.798	<0.001***	-2.022	0.043*	-4.677	<0.001***	-3.411	0.001**	
	Anxiety	0.271	27.522	<0.001	15.259	<0.001***	-1.274	0.203	-3.471	0.001**	-2.319	0.021*	
	Discrimination	0.301	34.490	<0.001	11.549	<0.001***	-0.590	0.555	-7.343	<0.001***	1.243	0.214	
	Emotional internalized stigma (1-alienatiton-item-ISMI)	0.297	33.443	<0.001	22.381	<0.001***	-1.058	0.290	-5.278	<0.001***	-1.115	0.265	

Regression Analysis on the Perceived Social Support

Using regression analysis (Enter method), we looked at which sources of perceived social support were predictors of lesser loneliness, depression, anxiety, discrimination, and internalized stigma in participants from Spain and Russia. For the Russian sample, the predictor for a reduced rate of depression and anxiety, as well as loneliness, discrimination, and stigmatization was perceived social support from only one of the three possible sources — the family. Perceived support from other sources (friends and significant others) was not significantly related to any of the variables under study.

By contrast, for the Spanish sample, the relationship between perceived social support and the variables under study was more diverse: 1) the predictor of less pronounced loneliness and depression was perceived social support from all three sources: significant others, family, and friends; 2) the predictor of less pronounced anxiety was the perceived support from family and friends; 3) perceived social support from the family was a predictor of less pronounced discrimination and stigma; and 4) family support was associated with a decrease in loneliness, depression, anxiety, discrimination, and internalized stigma. These results are shown in *Table 3*.

Discussion

This study highlights the consequences of the COVID-19 pandemic on various variables in a way consistent with previous research, which showed the impact of the crisis situation in different countries on increasing symptoms of anxiety or depression (Gonzalez-Sanguino et al., 2020; Wang et al., 2020a; Wang et al., 2020b; Mazza et al., 2020; Pappa et al., 2020; Voitsidis et al., 2020; Tanoue et al., 2020); increasing perceived loneliness (Banerjee & Rai, 2020; Losada-Baltar et al., 2020); and increasing the appearance of stigmatization (Singh & Subedi, 2020; He et al., 2020). The results of this cross-cultural study revealed differences in the psychosocial variables between the participants from Spain and Russia during the global crisis associated with the spread of COVID-19 in the first six weeks of the lockdown, as well as with the specifics of social support in this context.

Clinical variables such as depression and anxiety in the two countries did not differ significantly (although they were slightly higher in Spain), so this may indicate that the impact of the pandemic and the response at a clinical level have been similar in both countries. However, this assertion should be made with caution, since our research does not have pre-pandemic measures for comparison. Previous studies suggest that the prevalence and incidence of anxiety and depression were not equivalent in both countries previously, with a slightly higher proportion of the Spanish population exhibiting depressive and anxiety disorders (Institute for Health Metrics and Evaluation - IHME, 2017) than in Russia; this is also consistent with the slightly higher results in the Spanish sample.

The main differences between the two countries were found in the psychosocial variables, with the level of loneliness and stigma-related variables (perceived intersectional discrimination and 1-alienation-item-of internalized stigma) significant-

ly higher in the Russian sample, and perceived social support from family, friends and others significantly higher in the Spanish respondents.

These results may reflect certain cultural differences between the two countries, which, in times of a crisis, can affect the resources available to cope with the situation. Spain is a country where social relations play a key role, which has strong social networks, and where much attention is paid to family and other interpersonal relationships. These strong interpersonal and intergroup connections can protect an individual from feeling lonely and can prevent the feelings of being discriminated against and stigmatized, thus explaining the lower scores in the loneliness variables and stigma-related variables.

The differences between the two countries in the values of perceived intersectional discrimination could be explained by possible differences between the two countries in their valuations of different races, gender, disability, sexual orientation, or other status. The analysis by Ugidos et al. (2020) on the impact of COVID-19 on intersectional discrimination and stigma, found that the variables that best predict perceived intersectional discrimination and internalized stigma are depression and anxiety, and less family support. These authors note that these results could be explained by the fact that family support is a protective variable, allowing people to feel included in a family nucleus, and thus can buffer the harmful effects of stressful events by providing a sense of acceptance and self-worth, and reducing internalized stigma.

This explanation is also compatible with the results found in the differences in social support, where, significantly, the Spanish population showed it felt more supported by relatives, friends, and other sources.

In both countries, perceived social support acted as a buffer to mitigate the impact of the pandemic and the required containment measures on mental health, although there were differences between the two: in Russia only family support was significant, while in Spain, although family was the main protective source, friends and other sources were also significant protectors against loneliness. Perhaps this is also a sign of differences at the cultural level, where in Russia the family has a more important value and has perhaps been more accessible (higher percentage of married people) than friends in this crisis situation.

On the other hand, other cultural differences that might have been a determining factor in the differences in outcomes would be the respective governments' management of the crisis, with different styles of communication and transmission of information, as well as possible differences in the use and access of new technologies which allow contact with loved ones despite the confinement.

In any case, the results allow us to draw conclusions regarding the crucial role of perceived social support, results consistent with other studies conducted during the pandemic, which showed how social support had a negative relationship with anxiety in students (Cao et al., 2020), and a positive one with increased self-efficacy and quality of sleep among medical staff (Xiao et al., 2020). Additionally, our results highlight the role of family ties in the context of a pandemic and isolation from society regardless of the cultural context, and allow us to assume that those with low levels of perceived family support would become a risk group in the long-term perspective.

Conclusion

The present research has allowed us to ascertain the differences in the consequences of the pandemic in a sample of the Russian and Spanish populations. While in both countries the impact at the clinical level seems to be similar, differences are found at the psychosocial level, which may be key, and should determine the response needed to alleviate the effects of the crisis. Social support seems to be a protective factor for our psychological health, with specific cultural characteristics for each country, which must be taken into account as we seek to mitigate the consequences of the crisis.

Given the growing numbers of detected cases of coronavirus infection worldwide and the high degree of uncertainty of the situation, the mental health and well-being of the entire population and individual groups in particular are likely to be at risk for the foreseeable future. Although important short-term results concerning the impact of the pandemic on the mental health of the population in different countries have already been obtained, it is necessary to continue developing research in this direction on a global scale, taking into account the differences in socio-cultural context, in the characteristics of the epidemiological dynamic in individual countries or regions, in the restrictive measures taken, and also in their long-term effects on mental health.

In considering future lines of action to mitigate the loneliness of people in confined situations and increase social support, it should be noted that online technologies could be used to provide networks of social support and a sense of belonging (Armitage and Nellums, 2020). These authors indicate the suitability of training people in the use of digital resources, but also the usefulness of interventions involving more frequent telephone contact with significant people, close relatives, and friends, voluntary organizations or health professionals, or community projects that provide support during confinement. In addition, cognitive-behavioral therapy could administered online to decrease loneliness and improve psychological well-being.

Furthermore, to combat the stigma associated with the COVID-19 pandemic, we recommend being careful in the language used when talking about the disease; avoiding the spread of false news; and taking care to disseminate only precise information related to COVID-19 to the public, thus making it easier for people to request help (IFRC, UNICEF & WHO, 2020).

Limitations

The present research has several limitations. First, the type of sampling we used does not ensure that the sample is representative of the population, since groups such as the elderly, sexual and ethnic minorities, or others, were underrepresented. In addition, the type of online survey we used may also have excluded a significant percentage of persons who couldn´t have access to new technologies, in addition to lacking the ability to have an expert interviewer ask the person the questions.

Another limitation was the lack of inclusion of some relevant variables, such as whether the participants lived in a rural or urban area; these contexts could have made a significant difference in their perceptions of the pandemic. Finally, it should

be noted that some of the scales were translated into Russian or Spanish specifically for this research, without being validated or standardized in relation to the samples from these countries.

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Work Alienation During COVID-19:
Main Factors and Conditions
(An Example of University Professors)

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Background. The economic and social consequences of the COVID-19 pandemic pose a threat to psychological well-being in different spheres of life. In accordance with Self-Determination Theory, it is assumed that working conditions during a pandemic frustrate the psychological needs of people in the workplace, thereby increasing their alienation.

Objective. To study the influence of working conditions on work alienation among employees during the COVID-19 pandemic. As factors of working conditions, we studied workplace distancing (isolation), temporary flexibility of work, the use of information and communication technologies (ICT), and job insecurity.

Design. The study had a correlation design, used a survey, and consisted of two parts. The first part studied a sample of 62 university professors for dynamics of work alienation at three periods of time. The second part studied 104 subjects for the effect of workplace distancing (isolation), temporary flexibility, ICT, and job insecurity on work alienation.

Results. In the first part of the study, it was found that work alienation increased during the pandemic. The second part showed that workplace distancing, temporary flexibility of work, ICTs, and job insecurity are significant predictors of work alienation among university professors.

Conclusion. Changes in working conditions during a pandemic have negative consequences for employees in the form of alienation from work. This finding can have practical application in recommendations for organizations planning structural changes or transfer of employees to telecommuting.

Keywords: work alienation, working conditions, temporary flexibility of work, information and communication technologies, job insecurity, COVID-19

Introduction

The current situation in the world caused by the COVID-19 pandemic has many consequences, associated not only with physical health, but also with a wide range of phenomena of a psychological nature. Studies have been published confirming the negative effects of COVID-19 on mental health, such as symptoms of anxiety and depression, as well as stress and lack of self-esteem (Rajkumar, 2020). People have experienced an increase in negative emotions (anxiety, depression, and indignation) and in sensitivity to social risks, a decrease in satisfaction with life (Li, Wang, Xue, Zhao, & Zhu, 2020), and a lower level of positive emotions (Rasskazova, Leontiev, & Lebedeva, 2020). One study confirmed the association of economic and daily living conditions with anxiety symptoms during the COVID-19 epidemic (Cao et al., 2020). Several studies have examined the characteristics and conditions of various professional activities of people during the COVID-19 pandemic (Lan, Wei, Hsu, Christiani, & Kales, 2020; Maciaszek et al., 2020; Murphy et al., 2020). Studies have generally concluded that people in professional groups with intense interaction between people (healthcare workers, workers in the service, sales, and education sectors, etc.) are predominantly exposed to dangers in the form of infection and psychological consequences.

Given the impact of changing living conditions during the pandemic on people's psychological well-being, it seems to us important to study the relationship of working conditions with a psychological phenomenon known as work alienation. The theoretical foundation of our study is the basic principles of Self-Determination Theory (Deci & Ryan, 2000) and Kasser's approach (2009). We assume that changing working conditions hindered the satisfaction of basic psychological needs (autonomy, social belonging, competence [Deci & Ryan, 2000]) and security needs (Kasser, 2009), and play an important role in work alienation.

In this article, we focus our attention on the factors of changed working conditions during the pandemic and their impact on the experience of work alienation among teachers at higher educational institutions. Work alienation (WA) is understood as the psychological separation of the subject of labor from work and is a subjectively experienced state associated with the destruction of interpersonal relationships, which is expressed in the perception by the subject of helplessness, meaninglessness, and self-alienation (Vinokurov & Kozhina, 2020).

While the changes in working conditions caused by the pandemic are global in nature, their specificity for the sample we are examining should be considered in greater detail. As one of the main measures to prevent the spread and infection of COVID-19 in the Russian Federation from March 30 to May 11, 2020, a national self-isolation regime was mandated, and non-working days were introduced. The original document regulating professional activities was a Decree of the President of Russia (March 25, 2020). Further restrictive measures were introduced by state authorities of the constituent entities of the Russian Federation. These measures did not apply to employees of organizations performing activities to ensure the life and safety of the population. The activities of organizations not related to the provision and safety of the population were suspended, and workers who were unable to carry out their professional activities remotely were suspended from performing their jobs. As a result, in some organizations, employees were required to switch to remote working.

The above facts indicate the need for a differentiated approach to analysis of the impact of working conditions on work alienation. Thus, in relation to the sample of university professors we are studying, new working conditions and requirements have arisen: workplace distancing (isolation), temporary flexibility, the use of ICT, and a change in labor intensity. As a general factor associated with socio-economic conditions during the pandemic, we highlight the perception of job insecurity.

Work Alienation

In the psychological literature, there are various approaches to the conceptualization and operationalization of alienation from work; however, all authors consider this as a negative state, a person's detachment from work, which leads to low productivity, low job satisfaction, and other negative consequences. Empirical studies confirm the devastating consequences of work alienation for employees: changes in attitude to work (for example, reduced involvement in work), changes in behavior (absenteeism), health consequences (burnout), changes in work efficiency (decrease in labor productivity), as well as side effects (alcohol consumption) (Chiaburu, Thundiyil, & Wang, 2013).

One of the common approaches to the study of alienation is the socio-psychological concept developed by Seeman (1959) and later by Blauner (1964) regarding work alienation. According to this approach, alienation is analyzed as a specific state of a person, consisting of five main characteristics: powerlessness, meaninglessness, disorganization of norms, social isolation, and self-estrangement. Each of these aspects of exclusion refers to a certain psychological state, which results from different adverse environmental conditions (Seeman, 1959). Powerlessness is manifested if people feel that they have little control over their work. Meaninglessness occurs when workers feel that they are making insufficient contributions to the overall labor process and, therefore, do not see the significance of their role in it. Isolation means the absence of a sense of identification with the organization, its goals, and their colleagues. Self-estrangement manifests itself when employees feel that their work is not connected with self-realization, that it does not seem to be an end in itself, but only a means for something else, for example, material reward (Blauner, 1964). Many authors consider WA to be the opposite pole of work involvement (Hirschfeld, 2002; Macey & Schneider, 2008; Shantz, Alfes, Bailey & Soane, 2015). This approach is based on Kanungo's theory (1979), which understood alienation as a generalized cognitive state of "psychological distancing" from work. The author explains the mechanism of "alienation–involvement" with reference to satisfying the psychological needs of the individual in the workplace. For different groups of people, different needs, depending on their intensity, will play a role in the emergence of states of either involvement or alienation.

In our view, alienation from work is a complex negative mental state associated with the destruction of interpersonal communications, expressed in the perception by employees of powerlessness and loss of meaning concerning their activity, working environment, and social environment; loss of self-identification in the role of an organizational employee; and violation and errors of interaction and communication (Vinokurov & Kozhina, 2019).

In all of the above studies, work alienation was considered as a construct subject to external changes in the conditions and content of work. We therefore assume that due to the changed working conditions during the pandemic, workers are becoming more alienated from their work. These assumptions are presented in the following hypothesis:

H1: *Work alienation increases during the COVID-19 pandemic.*

Workplace Distancing (Isolation)

By workplace distancing (isolation), we mean the performance of one's job at a physical distance from the immediate place of work in the organization. Given the spatial distance, people lose their usual workplace and work organization, as well as the opportunity to interact with other people in a traditional workplace. The conditions of the workplace distancing have some similarities with the conditions of telework, namely, that employees can work outside the organization's premises (Bailey & Kurland, 2002). The main difference between flexible spatial organization of work and spatial distance of work is that in the former, under conditions of telework, employees agree to and accept these working conditions; they have autonomy regarding where they can perform their work duties. In contrast, with spatial distance (isolation), employees lack the psychological readiness to carry out professional activities in these conditions. Thus, university teachers who were forced to work at home, outside their classrooms, had to learn new methods of work without preparation, and to compile new materials for lectures, seminars, and certifications suitable for remote work.

We assume that spatial distance increases labor intensity and stress. Additionally, workplace distancing is associated with social isolation (Cooper & Kurland, 2002; Harris, Winskowski & Engdahl, 2007). These authors argue that the spatial distance makes employees invisible in the workplace; they are excluded from office gossip and tend to exchange only formal information (Bailey & Kurland, 2002), lack affective attachment and emotional support (Mann, Varey & Button, 2000). Golden, Veiga, and Dino (2008) suggest that physical separation from colleagues means psychological separation and a feeling of alienation that is associated with reduced labor productivity. Thus, in conditions of workplace distancing, there is increased physical and psychological stress. It can be assumed that with a heavy workload, workers feel helplessness, powerlessness, and begin to feel alienated from their work. Moreover, spatial distance and temporary mobility create conditions of social isolation, in which the worker experiences loneliness in the workplace. Needs for social attachment at the workplace cannot be satisfied, which entails alienation from the social norms and values of the organization, and alienation from work in general. These assumptions allow us to put forward a hypothesis:

H2: *With an increase in the subjective significance of workplace distancing, the state of alienation from work is more intense.*

Temporary Flexibility of Work

Temporary flexibility is characterized by flexible planning and distribution of working hours, in which employees decide when they will perform their duties

(Demerouti, Derks, Ten Brummelhuis, & Bakker, 2014). Temporary mobility is often analyzed in studies concerning perception of the balance between work and personal life. The ability to independently plan your working hours can lead to increased working hours and overtime, the desire to constantly and quickly respond to messages. Studies on the role of flexible work schedules indicate that with a constant connection to work, a person feels emptier. At the same time, incoming emails often have nothing to do with work, which in turn causes exhaustion (Ten Brummelhuis, Bakker, Hetland, & Keulemans, 2012). Due to these factors, employees experience pressure and stress at the workplace. Studies show that telework pressure is negatively related to satisfaction with the work–life balance. This connection can be explained by psychological detachment (Barber, Conlin, & Santuzzi, 2019).

Temporary flexibility in working time can also affect the perception of social isolation by employees. Social isolation is an objective characteristic of the employee's social environment, which is reflected in the degree of social interactions and relationships in the workplace (Wright, 2005). Some studies have found that flexible working conditions with respect to time and space are a factor in professional and social isolation (Gainey, Kelley, & Hill, 1999; Turban & Wang, 1995). Employees who have autonomy in planning their time may intentionally or unintentionally reduce the duration of interactions or exclude the time for interactions with colleagues, superiors, or subordinates. Thus, as with workplace distancing, flexible work schedules can lead to a high degree of stress, exhaustion, and feelings of emptiness, making a person experience a state of helplessness in the workplace, which is one of the symptoms of work alienation. Besides, the susceptibility to social isolation with temporary work flexibility is important for work alienation, as this construct is associated with broken communication and communication processes, and develops due to low satisfaction of the need for social support at the workplace. These factors allow us to put forward the following hypothesis:

H3: *With increasing temporal flexibility of work, the state of work alienation increases.*

Information and Communication Technologies

The use of information and communication technologies means that employees use new media technologies, such as smartphones, tablets, laptops, and video conferences, to communicate with colleagues, superiors, or customers (Demerouti et al., 2014). Both in terms of temporary work flexibility and ICT, studies show that these factors increase the workload and, as a result, increase stress. Working relations are mixed with family life, which manifests itself in a low quality of work–life balance (Fazili & Khan, 2017).

Research on telework is controversial regarding the positive and negative effects of ICTs on social relations in the context of work. Several studies have noted that widespread use of the Internet gives employees fewer opportunities for social interaction (Mann & Holdsworth, 2003; Nie & Erbring, 2000; Vega & Brennan 2000). Although some technologies approach the richness of personal communication, they are not equivalent and cannot replace eye contact and physical presence, are

not able to transmit a full range of meaningful information for interpreting interactions (Straus & Olivera, 2000). We assume that the widespread use of ICT in work affects the distortion of information transfer and causes a lack of feedback. This, in turn, can affect the awareness of the meaning of one's work, as well as adherence to the norms and values of the organization. Therefore, we can assume that if communication between members of the organization occurs exclusively through ICT, employees are alienated from their work, team, and organization. These assumptions allow us to formulate a hypothesis:

H4: *With an increase in the use of ICT, the state of work alienation increases.*

Job Insecurity

We consider job insecurity to be another factor in labor conditions during the pandemic. Job insecurity is manifested in subjective perceptions about employment and unemployment and reflects the uncertainty, insecurity, helplessness, and powerlessness that people experience when they are not sure that their work will remain stable (De Witte, 2005). They are afraid of losing their job or that there will be changes in significant parameters of their employment—its volume, remuneration, the regime or intensity, a change of position (Demin & Petrova, 2010). We consider this factor as common to workers of different professional groups, since it can reflect not only individual career prospects in the organization, but also the socio-economic conditions of society as a whole. Studies show that reliability negatively predicts alienation from work (Taamneh & AL-Gharaibeh, 2014; Zaki & Al-Romeedy, 2018). The results of a study on structural changes in the organization showed that job insecurity influenced affective commitment, while this relationship was partially mediated by exhaustion and low perception of fairness (Schumacher, Schreurs, Van Emmerik & De Witte, 2016). Based on the results of previous studies, we assume that the pandemic creates changes in working conditions in which workers perceive high job insecurity. Since work alienation is analyzed as a complex state, the job insecurity will have an impact, first of all, on such a symptom of alienation as helplessness. Together with a feeling of unreliability and powerlessness about their future in a particular workplace, subjects feel increased alienation from their work and organization. This assumption is expressed in the hypothesis:

H5: *Job insecurity predicts the dynamics of work alienation.*

Methods

This study had a correlation design, used a survey method, and consisted of two parts. In the first part, in order to determine the dynamics of WA during the pandemic period, a measurement of this variable was administered to subjects who had previously participated in a dissertation research, which was devoted separately to the problem of work alienation. Information was obtained from three time points of WA measurement: the distance between the first and second survey was 1.5-2 months, between the second and third, 1 year and 3 months. The second part of the study investigated the effects of working conditions on WA indicators.

Participants

The first part of the study, devoted to the dynamics of WA, surveyed 62 respondents who were able to answer the questionnaire about work alienation at all three time points. The sex distribution was 44.6% men and 55.4% women; the average age was 46.29 years (SD = 11.2). The second part of the study involved 104 people, of whom 41.3% were men and 59.7% women; the average age was 48.29 years (SD = 12.3).

The study sample consisted of university professors. This sample was used because WA is especially characteristic of knowledge workers (Archibald, 2009; Nair & Vohra, 2010). All subjects had a permanent labor contract and a 40-hour workweek. The complete survey that includes the questionnaire "Working Conditions for Teachers in a Pandemic" took place in the second week of June 2020. From March 30, and, including the period of the survey, all subjects were transferred to telecommuting. The data was collected anonymously; participants were informed through an introductory text about the anonymity and voluntariness of their participation.

Questionnaires

Alienation from work was measured by the *Questionnaire of Work Alienation* (Aigner, Marx, Panhans, Sassmann, & Seifert, 2014), adapted for the Russian-language sample by Vinokurov and Kozhina. The questionnaire consisted of a scale of alienation from work at the level of satisfaction of basic needs, which included 60 questions. Cronbach's alpha for this scale was 0.81, which indicates good reliability.

The second stage of the study was to measure the influence of factors of working conditions on WA. Workplace distancing, temporary flexibility, and the use of ICTs were measured using the authors' questionnaire, *Working Conditions for Teachers in a Pandemic,* compiled by Kozhina and Vinokurov. This questionnaire was constructed as a written version of a structured interview and included 15 points, five items for each of the conditions (scales). The response format ranged from 1 (*never*) to 5 (*always*). Example items are: "Can you do your job on the university premises?" (reversed for workplace distancing); "Can you choose your working hours freely?" (for temporary flexibility); "Can you hold lectures, seminars, and other course formats through online conferences (Zoom, Skype, etc.)?" (for ICT). The calculated value of Cronbach's alpha = 0.80 indicates a good internal consistency of the scale descriptions.

Job insecurity was measured using the questionnaire *Job Insecurity Measurement Technique* (Demin & Petrova, 2010), which contained 28 items.

Results

Statistical analysis of the data was performed using SPSS 22. The variables were checked for normal distribution and sphericity and they satisfied these conditions (*Table 1*). In order to test our first hypothesis, a one-way analysis of variance with repeated measurements was applied. The results, presented in *Table 2*, confirmed a significant change in the indicators of work alienation in time.

Table 1

Descriptive statistics for three time points of measure of work alienation

	N	M	SD	Skew	Kurtosis
work alienation1	62	6.40	0.89	0.47	0.79
work alienation2	62	6.66	0.75	0.45	0.76
work alienation3	62	9.78	1.07	0.49	0.83

Table 2

Repeated measures analysis of variance of work alienation

Effect	MS	df	F	p	Greenhouse Geisser	Huynh Feldt
Time	.07	3	29.53	< .001	< .001	< .001

The second stage of the study was conducted on a sample of 104 participants, which allowed us to apply regression in accordance with general recommendations for the sample size. To study the effect of working conditions on alienation from work, a multiple regression analysis was performed (*Table 3*), showing that 56% of the variance of the variable of alienation from work can be explained by the combined influence of the independent variables: workplace distancing, temporal flexibility, ICT, and job insecurity. The predictor of job insecurity has a stronger effect on the assessment of WA. The variables workplace distancing and temporal flexibility make approximately the same contribution. The influence of the ICT predictor on work alienation is weaker than the other variables. The values of the corresponding coefficients and level of significance are presented in Table 3.

Table 3

Multiple regression analysis for effect of working conditions on Work Alienation

Predictor	B	SE	β	R²
Workplace distancing	0.82	0.72	0.48**	.56**
Temporal flexibility	1.15	0.62	0.46**	
ICT	1.06	0.53	0.42**	
Job insecurity	1.27	0.76	0.51**	

Note. **$p < .01$; N = 104.

Discussion

The first hypothesis of our study can be confirmed, since we found a significant change in the alienation from work between measurements of this variable over time. Work alienation, measured in the third time period, corresponding to the period of the COVID-19 pandemic, showed a significant difference and higher

rates in comparison with the first and second time periods. This leads us to the conclusion that the work alienation of university professors who were transferred to remote work increased during the pandemic. These results are consistent with previous studies considering work alienation as a construct subject to external changes in the workplace related to working conditions (Chiaburu et al., 2013). We hypothesized that certain changing working conditions influence the perception of alienation from work. So, hypothesis 2, about the influence of workplace distancing on the WA was confirmed, and workers who are forced to carry out their professional activities at a physical distance from their traditional place of work experience work alienation. The results of the study support hypothesis 3, that temporal flexibility is a significant predictor of WA. It follows from this that the more the employee has the opportunity to plan his own work schedule, the more he is alienated from it.

The fourth hypothesis, confirming the effect of the use of ICT on WA, was also confirmed: The more workers use ICT for work purposes, the higher their work alienation. These results confirm the literature on flexible working conditions and the increased use of ICT for communication in the workplace as a threat to the psychological well-being of workers.

It should be noted that in this research, the studied working conditions were introduced rapidly, for prevention of infection with COVID-19, beyond the will and choice of workers. On this basis, the results of our study differ from the conclusions of some studies indicating the positive consequences of telework for employees and organizations, such as increased labor productivity and increased job satisfaction.

The fifth hypothesis also finds confirmation, since job insecurity is a significant predictor of WA. Therefore, the unreliability of work is a factor in predicting the dynamics of alienation from work.

Conclusions

This study was designed to shed light on work alienation as a potential psychological consequence of changes in work organization during the COVID-19 pandemic. The objective was, firstly, to study the change in work alienation among teachers at higher educational institutions during the pandemic. Secondly, we aimed to study the effect of changing working conditions on work alienation. The first stage of the study revealed that the indicators of WA during the pandemic period rose. The increasing alienation from work during a pandemic provides a new look at the dynamics of this construct, since the psychological literature shows a shortage of longitudinal studies on this topic (Zeller et al., 1980). It can be assumed that work alienation is a relatively time-stable construct that remains unchanged under stable environmental conditions. At the same time, alienation from work can increase with changing working conditions that frustrate the satisfaction of psychological needs in the workplace (Kanungo, 1979).

In the second part of the research, we studied some working conditions that arose or changed during the pandemic. We found that workplace distancing, temporary flexibility of working time, the use of ICT, and job insecurity determine the work alienation of teachers at higher educational institutions. In formulating the research hypotheses, we proceeded from the fact that these conditions

frustrate the satisfaction of basic psychological needs, in particular, the need for social communication in the workplace (Deci & Ryan, 2000) and the need for security (Kasser, 2009, 2011). Future research should be aimed at a more detailed study of the psychological mechanisms that determine the impact of these working conditions on WA. As variables that play a mediating role in this influence, the work–life balance and loneliness in the workplace could be studied. The possible moderator effect of the need for affiliation and psychological quality of life could also be studied.

As noted above, the investigated working conditions were forced upon employees in unusual circumstances and were not selected by them based on their intentions and preferences regarding the organization of their work. It would be promising to study violations of the psychological contract, as well as the role of autonomy regarding the impact of working conditions on WA.

Concerning practical applications, the results of this study are valuable for the light they shed on the possible consequences of reorganization and structural changes in organizations. The results indicate that providing employees with temporary flexibility for working hours and the ability to perform their work duties at home using ICT rather than in the office can have negative consequences, in the form of increased work alienation. Based on these considerations, we recommend that heads of organizations planning to transfer employees to remote work use a differentiated approach, depending on the psychological characteristics of the employees, to develop methods for preventing work alienation under changed working conditions.

Limitations

As noted above, three time points on one sample of subjects were compared to measure the dynamics of work alienation, with unequal time intervals between the surveys. This limitation is due to the field condition of the study, as we considered unplanned changes caused by pandemic conditions. In the future, we plan to investigate the dynamics of WA using a long-term study with a large number of equally distanced time segments.

The small sample size, consisting of 62 subjects, in the first part of the study should also be noted. Feedback on the third measurement point was low, since not all study participants could be contacted for the third segment of the survey. For future research, it would be necessary to conduct a longitudinal study on a larger sample.

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The COVID-19 Experience: Features of Culture and Belonging in the Context of Peoples Native to a Country and Migrants

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Background. COVID-19 has revealed the diversity of cultural characteristics and mentalities of different countries: every people living through the pandemic interprets the means of overcoming the crisis in their own way, in accordance with their historical experience and cultural traditions.

Objective. The purpose of this study (April 2 — May 2, 2020) was to identify the influence of cultural factors and the context of residence (living in their own country or in another culture as a migrant) on how people perceive and experience a pandemic.

Design. The study involved 605 people: 402 Russian-speaking respondents (221 migrants living outside their countries) and 203 representatives of other cultures (165 Spaniards and 38 migrants from different countries). The main research method was a survey using a specially prepared questionnaire (in four languages — Spanish, English, German, and Russian).

Results. Cultural factors had a strong influence on how a people experienced a pandemic. Respondents from European and other cultures (non Russian speakers) were very intolerant of dissent in the fight against the pandemic; showed an increase in patriotism; and demonstrated increased readiness for an operational response to the situation through a change of activity. Russian-speaking respondents showed great loyalty to different positions and different behaviors during pandemic situation; expressed the desire to wait out the pandemic and quickly return to their usual way of life; their main preventive measure was self-isolation, which was considered an opportunity for the development of something new. The perception of a pandemic by migrants differed from its perception by the native population.

Conclusion. Common to all representatives of the international sample were the ideas of necessary international cooperation and universal responsibility to overcome the pandemic. But the cultural factors and having a migrant's status had a strong influence on the perception and experience of the pandemic, which depends on the mentality and historical experience in different countries.

Keywords:
COVID-19;
perception
and experience
of pandemic
situation;
ethno-
psychology;
cultural
features;
migrant status

Introduction

Over the past decades, the processes of globalization have affected not only economics and politics, but they have also led to the blurring of cultural boundaries between different communities, and even homogenization of many features of people's daily life. To a large extent, migration processes themselves contributed to this, as the scale of migration over the past half century has become extremely widespread: by 2017, the number of migrants in the world amounted to almost 260 million people (United Nations [UN], Migration). The tasks of regulating the processes of migration and assistance to immigrants are a part of government programs in many countries around the world.

However, the COVID-19 pandemic has forced many countries to re-designate their border policies, and also revealed the different characteristics of the culture and mentality of each country. The threat of the spread of the virus has forced residents of different countries to respond to a rapid wave of infections, and it turns out that every people living in a pandemic and quarantine situation interprets the means of overcoming the crisis differently, in accordance with their specific mentality, historical experience, and cultural traditions.

Modern culture is characterized by contradictory trends on ethnic processes. On the one hand, the processes of globalization have led to the melding of material and spiritual culture of different social communities; on the other hand (as it has turned out), globalization itself, by intensifying contacts between cultures, has contributed to the strengthening of ethnic attitudes and ethnic identity (the term "ethnic revival" can be found in the scientific literature these days).

According to experts, among the many features that differentiate ethnic groups and mark group boundaries, the main role is played by features that reflect cultural distinctiveness. Culture is the main factor underlying interethnic psychological differences (Stefanenko, 2014). At the same time, culture in ethnopsychology, in accordance with the classical approach of H. Triandis, is considered primarily subjective — a set of common ideas, attitudes, and beliefs about their community. Cultural features have a strong connection to a community's traditions and historical experience.

The strengthening of ethnic self-awareness and ethnic identity is significantly associated with the intensification of cross-cultural contacts, including the powerful migration flows that have reached an unprecedented scale in recent decades. The modern humanitarian literature contains a huge number of studies about the experience of migrants, the difficulties they have adapting in a new cultural context, and the factors that contribute to their successful intercultural adaptation. The models and stages of the adaptation process are described in particular in the works of J. Berry.

The pandemic situation has led to a transformation of people's habitual life space, including limiting their mobility to their immediate environment. It is weakening, and often making impossible, the ability to communicate outside of one's group. The pandemic is associated with various threats to life, health, and social and psychological well-being. It is also potentially capable of intensifying a collective and individual consciousness of the need to deal with threats to a group's safety, including actualization of feelings of "we-they" and "ingroup-outgroup." In this

regard, the pandemic situation provides a unique opportunity to study the psychology of migrants.

This study is based on the interaction of the traditions of ethnic psychology and migrant psychology; it combines these two areas in a single original context, dedicated to analyzing the impact of factors of ethnicity and migrant status on the reaction of an unprecedented global crisis — the COVID-19 pandemic.

The aim of our previous study (Lupulyak & Grishina, 2020) was to study the motivations for migration and the self-awareness of a migrant in a new life context. A comparative analysis of different groups of migrants revealed significant differences between Russian-speaking migrants and migrants from other countries living in Spain. They specifically related to the migrants' motivations for deciding to change their country of residence: about a third of Russian-speaking migrants indicated the interests of relatives as the most important factor in their decision, while this motivation was not typical for migrants from other countries. At the same time, Russian-speaking migrants (almost 60%) said that they experienced difficulties living in their new country (unlike almost the same percentage of migrants from other countries who said they did not experience any difficulties). In particular, they expressed having problems with language (40%, unlike 20% of migrants from other countries).

One potential factor in migrants' negative self-awareness of being in a new country is that their motivation for moving was associated with the desire to get away from the difficulties of their previous life situation and hopes for better conditions in a new life context. At the same time, a group of Russian-speaking participants in the study was characterized by the recognition of the positive potential of migration as a change in human life (62%), while respondents from other cultures assessed their migration in more restrained tones (a positive assessment was given by only 24% of respondents) (Lupulyak & Grishina, 2020).

The results of that study suggested that a pandemic that has changed people's lives (by quarantine, isolation, disrupting familiar activities and forms of communication, anxiety for the future, etc.) will have different effects on people belonging to different cultural contexts. The tasks of this current work were based on those differences and included identifying the similarities and differences in groups' opinions between Russian-speaking respondents and respondents from other cultures, people native to a country, and migrants, as well as analyzing the positions where there is a tendency for the coincidence or convergence of opinions between the Russian-speaking and another migrants.

The purpose of this study, which was conducted from April 2 to May 2, 2020, was to identify the influence of cultural factors and the context of residence (living in their own country or in another culture in the status of a migrant) on how people perceive and experience a pandemic situation.

The development of this issue is very relevant for two main reasons: first, it will provide an impetus for further study of the impact of ethnic characteristics on coping with crisis and extreme situations, as well as for a deeper study of the psychology of migrants. Secondly, it allows us to actively apply the data obtained in various spheres of social and political life, in order to optimize operational interaction between a state and a citizen in extreme and/or crisis situations.

Understanding the original components of the "ethnic matrix," especially now, can be very useful for government agencies. In the context of the pandemic crisis, governments create solutions that are aimed at changing the lifestyles of the population. Understanding the ethnic matrix will allow them to minimize the negative public perception of their policies by creating a discourse and social advertising which will appeal to the values of particular groups of the population, either people native to a country or migrants.

Methods

Participants

This study involved 605 people from 18 to 80 years old. Group of Russian-speaking respondents (402 participants) consists of two subgroups: (1) individuals who are at the time of the survey in their countries of birth and permanent residence (Russian Federation or countries of the post-Soviet bloc: Ukraine, Belarus, the Baltic States, etc.) — 181 participants, who are classified as "native population" when interpreting the results; (2) persons with the status of migrants in countries of residence that are not countries of their origin — 221 participants (in Spain — 186 respondents, in other countries — 35 respondents). Of the Russian-speaking respondents, 309 respondents were women and 93 participants were men; 73.1% of all respondents were 30–55 years old, and 17.4% were 56–80 years old.

The rest of the sample was comprised of 203 participants. It consists of two subgroups: (1) 165 Spaniards (with a small percentage of residents of some European countries) who are in the countries of their birth and permanent residence; (2) 38 migrants from different countries of the world (mainly from Europe and Latin America) living in Spain at the time of the survey. 87 respondents were women and 116 were men. Seventy-eight percent (78.3%) of all the foreigners we interviewed belonged to the age category of 41 to 70 years and 19.7% to the category of 18 to 40 years.

When forming the target sample, the authors used random selection of respondents in the study group-strata. Identification of respondents with regard to their status as belonging to native or migrant groups was based on the results of the respondents' response to the questions about their location (in their own country or in the country of their permanent residence as a migrant, less than 5 years or more than 5 years). Respondents were identified as belonging to a group of Russian-speaking or participants from another cultures based on the language principle.

Procedure

Our main research method was a survey comprised of a specially prepared questionnaire, which was developed on the basis of our experience and the results of our previous study. The questionnaires were distributed in four European languages (Spanish, English, German, and Russian) using Google Forms. During statistical processing, we used the method of frequency analysis using contingency tables and a chi-square criterion, as well as a qualitative content analysis of statements respondents made on their attitudes towards the pandemic.

The survey was conducted in the google-form (from the south of Spain, the city of Marbella, where the one of the authors also lives as a migrant). In total, residents and migrants from 24 countries answered the questionnaire. All subjects had a secondary or higher education. The professional composition of the respondents, as well as the degree of their employment at the time of the survey, was very diverse.

This article presents the results of a comparative analysis of the data of four groups of respondents: 1) Russian-speaking respondents living in their own countries, 2) Russian-speaking respondents-migrants, 3) European respondents living in their own countries (mostly residents of Spain), and 4) migrant respondents from different countries (non Russian-speaking).

Results

The Impact of Cultural Factors on the Pandemic Experience

The results revealed a number of positions on which the opinions of representatives of all four groups were almost identical (see *Table 1*).

Table 1

The proximity of the opinions of different groups of respondents*

Types of Statements	Russians in their own countries (%)	Russian-migrants (%)	Europeans in their own countries (%)	Other migrants (%)
In your opinion effective control of pandemic is a result of reasonable cooperation between citizens and authorities	90	90	90	92
The control of the pandemic is a responsibility of all the states and people without exception, regardless of their national identity	86	86	92	89
Which feeling prevails in you with regards to the ongoing situation? Anxiety, nervousness	40	37	31	40
What makes you happy about the ongoing situation? Nothing makes me happy	30	28	38	30
What makes you happy about the ongoing situation? A possibility to be with family or those close to you	27	24	27	22
Frequent mentions of fatal casualties due to coronavirus and images of funeral convoys: I try not to think about it	28	28	22	22

Note. * The differences are statistically insignificant

Regardless of status and nationality, almost all respondents agreed on the need for cooperation between an individual and the state, and universal international responsibility in overcoming the pandemic. Approximately the same percentage

of respondents from different countries tried to avoid thoughts of death, but frequently mentioned deaths from coronavirus infection. The universal mood of most respondents was anxiety; a third of all subjects admitted that they found no reason for positive emotions in the pandemic situation, in contrast to a quarter of the survey participants who said they enjoyed the opportunity to be together with their families or loved ones.

While a convergence of opinions among migrants and the native population of the various countries of origin was revealed on a number of statements, at the statistical level there were differences ($p<0.005$ and $p<0.001$) between the responses of groups of Europeans, and respondents from Russia and the post-Soviet space (see *Table 2*).

Table 2

Positions that revealed differences between representatives of the Russian-speaking sample and other foreign respondents, with a relative coincidence of opinions at the intergroup level

Types of Statements	Russians in their own countries (%)	Russian-migrants (%)	Europeans in their own countries (%)	Other migrants (%)
Attitude towards dissent regarding COVID-19				
Information about the absence of emergency measures and scarce control of the pandemic in one or another country incurs in you: Anger and indignation**	48	50	89	72
Information about the absence of emergency measures and scarce control of pandemic in one or another country incurs in you: It's their right; they should know what to do**	43	44	8	19
Patriotism level				
Do you feel more at ease than before with the involvement and measures your country has taken during this state of emergency? Yes**	35	45	71	69
Personal pandemic crisis				
Can you say that after the state of emergency due to the coronavirus spread, that you've been suffering a personal crisis? Yes**	19	28	9	8
Preventative measures				
What preventive measures have you taken in order to avoid infection? Self-isolation*	45	51	38	28
What preventive measures have you taken in order to avoid infection? Absence of direct contact with people outside your self-isolation area*	17	19	23	36

Types of Statements	Russians in their own countries (%)	Russian-migrants (%)	Europeans in their own countries (%)	Other migrants (%)
Willingness to change				
Given the impossibility of working or carrying out your usual routines at present, how do you take advantage of this confinement? Do you contemplate the possibility of pivotal change of your activity after the quarantine**	5	6	30	50
Pandemic deficiency				
What do you miss the most in the ongoing situation? Friends and family**	8	11	32	17
What do you miss the most in the ongoing situation? Work**	10	10	21	20
What do you miss the most in the ongoing situation? I am fully served**	13	9	4	3
Coping strategies				
What are you doing during the period of forced self-isolation? Useful things	37	35	29	28
Given the impossibility of working or carrying out your usual routines at present, how do you take advantage of this confinement? You use the current moment to learn something new	38	41	3	14
What are you doing during the period of forced self-isolation? Trying somehow to kill time*	7	8	16	14
What helps you cope with the stress caused by the state of emergency? Belief in God	12	10	8	7
What helps you cope with the stress caused by the state of emergency? Information received from authorities and mass media*	2	3	7	11
Involvement in the informational field				
How often do you watch the news? I don't watch the news*	13	12	5	6
Hopes and forecasts				
In your opinion, on a day like today a year from now: Coronavirus will be left behind, remembered with a smile ; life will return to its usual course**	18	15	0	0

Note. * — *differences are statistically significant (p≤0.05):* ** — *differences are statistically significant (p≤0.01)*

The Impact of Migrant Status on Experiencing the Pandemic

Particularly noteworthy were those question on which the opinions of the migrant groups tended to coincide or come close, and the opinions of representatives of groups people native to a country did not (see *Table 3*).

Table 3

Positions on which there was a tendency to a coincidence or convergence of opinions between Russian-speaking and foreign migrants

Types of Statements	Russians in their own countries (%)	Rus-sian-mi-grants (%)	Europeans in their own coun-tries (%)	Other migrants (%)
Attitude toward violators of the emergency				
People who violate the quarantine bring out in you: Irritation and anger**	56	53	84	58
People who violate the quarantine bring out in you: I don't care what others do, if it doesn't affect me directly*	15	21	8	15
People who violate the quarantine bring out in you: sympathy to their wish of not wanting to be locked up indoors**	30	26	8	27
Relationships with close people during the pandemic				
After the state of emergency due to the co-ronavirus spread, your relations with your loved ones have suffered no change**	72	51	56	47
After the state of emergency due to the co-ronavirus spread, your relations with your loved ones have deepened**	14	33	32	47
How do you satisfy your needs to commu-nicate during the period of self-isolation? Through private correspondence in mo-bile applications or e-mails*	17	27	25	39
How do you satisfy your needs to commu-nicate during the period of self-isolation? By telephone**	58	48	30	25
Do you abide by the coronavirus preven-tion instructions? Yes, because it can keep my loved ones safe from infection	44	48	55	64
Mood during the pandemic				
Which feeling prevails in you with regards to the ongoing situation? State of calm	34	40	34	40
What worries you the most in the ongoing situation? The situation of uncertainty**	25	38	31	50

Types of Statements	Russians in their own countries (%)	Russian-migrants (%)	Europeans in their own countries (%)	Other migrants (%)
The uncertainty of the current state of emergency does not allow me to organize my life as I would like to: Yes*	70	79	66	72
Which feeling prevails in you with regards to the ongoing situation? Spite, impotence, wrath**	7	6	16	3
Preventative measures				
What preventive measures have you taken in order to avoid infection? Measures to enhance personal immunity (sports activities, showering with cold water, etc.)*	6	13	5	11
What preventive measures have you taken in order to avoid infection? Tightened individual hygiene measures**	27	10	32	22
Coping strategies				
What helps you cope with the stress caused by the state of emergency? Belief in myself	8	10	4	8
What helps you cope with the stress caused by the state of emergency? Belief in a positive outcome whichever way the situation turns**	40	45	23	33
What helps you cope with the stress caused by the state of emergency? Family support**	17	14	38	25
What are you doing during the period of forced self-isolation? Personal growth and self-improvement*	8	15	8	17
Involvement in the informational field				
How often do you watch the news? A few times per day**	32	27	46	39
Willingness to change				
Given the impossibility of working or carrying out your usual routines at present, how do you take advantage of this confinement? You are ready to perform the work that will be most in demand, even if it is not to your liking	8	13	22	29
In the present state of emergency due to the pandemic situation, are you ready to take important decisions with regards to yourself and your loved ones? Yes*	39	35	52	44

* — differences are statistically significant (p≤0.05); ** — differences are statistically significant (p≤0.01)

Discussion

The Impact of Cultural Factors on the Pandemic Experience

An analysis of the results allows us to note a number of cultural differences. Representatives of the different cultures evaluated the actions of those countries that are not actively fighting the pandemic much more negatively than the Russian-speaking respondents did. At the same time the Russian-speaking participants were of the opinion that each country is free to choose its own strategy for combating COVID-19. Respondents from different countries felt much more involved in the fate of their countries during the pandemic than the Russian speakers. Russian-speaking respondents took self-isolation as the main measure of preventing infection; in the rest of the sample this measure went along with refusing direct contacts with someone outside the quarantine zone.

The majority of Russian-speaking respondents used the period of self-isolation to learn something new and do useful things, and other (non-Russian speakers) participants were more focused on considering the possibility of a radical change in activity, were more likely to "kill time" during quarantine, and were more likely to miss their jobs. This part of respondents were more likely to lack friends and family during quarantine, while among Russian-speaking respondents, there was a higher percentage of those who, in their own words, did not feel a deficit in any area. Compared to others, a larger percentage of Russians admitted that they were experiencing a personal crisis during the pandemic, while some Russian-speaking respondents hoped that in a year, everything would be back to normal; among representatives of other cultures no one choose this option. At the same time, believing in a positive outcome of the situation helped the Russian-speaking respondents to cope with the difficult situation to a greater extent than the anothers.

European respondents and representatives of other cultures were characterized by a negative attitude towards dissent in the fight against a pandemic, an increase in the level of patriotism, and a willingness to maintain self-isolation and refuse contact with anyone outside the quarantine zones. The main resources for coping with stress were work and especially the family, which might indicate a clear or latent fear of death, given that "close relationships with other people perform a powerful defense function, including the defense from existential threats, primarily from the threat of the finiteness of existence" (Grishina, 2018). Representatives of this group had an increased readiness for an operational response to the situation through a cardinal change of activity.

The sample of Russian-speaking respondents reflected greater tolerance of the strategies of other countries regarding coronavirus, expressed the desire to wait out the pandemic, and chose self-isolation as the main preventive measure, seeing it as an opportunity to learn something new and to implement useful things. The wait-and-see position was also manifested in the desire to return in a year to the usual way of life. Despite a higher percentage of respondents experiencing a personal crisis, the characteristic coping strategy for this group was an irrational belief that everything will be fine.

Such obvious differences in attitudes toward the pandemic can be partly explained by differences in the worldviews of the Western and Russian mentality.

The format of this article does not allow for a detailed analysis of such a broad topic, but it is worth briefly mentioning the role of ideas of utilitarianism and hedonism in formation of modern Western values, as well as the special attitude of the Russian people toward suffering. Suffering, in accordance with the traditional Russian mentality, leads to inner development and reveals the truth of life (Golovanivskaya, 2019). In light of this worldview, a pandemic is much more likely to be perceived by Europeans as a tragedy, unlike the Russians, who can interpret it as experience.

When studying the context of a pandemic living in European countries and in the post-Soviet space, it is noteworthy that the national media compare the current crisis with various reference points in the history of various countries. Thus, in European countries, when describing the impact of the pandemic on a person, the social sphere, and the economy, there is a reference to the scale of the consequences of the Second World War (1941–1945) ("La Pandemia de Coronavirus…", 2020; "Coronavirus Pandemic Worst Crisis since Second World War…", 2020; "Coronavirus: la più grande recessione dal Dopoguerra?…", 2020). In Spain, in addition, parallels are drawn with the Spanish Civil War (1936–1939) (Berdún, 2020; "De Guindos: España afronta la peor crisis económica desde la Guerra Civil…", 2020). In the countries of Latin America, the United States, and China, comparisons are made with the consequences of the Great Depression (1929–1933) ("Coronavirus: Worst economic crisis since 1930s depression…", 2020; "Coronavirus Slump Is Worst Since Great Depression…", 2020). Moreover, in the countries of the post-Soviet space, the comparison of the current crisis occurs with two main events: the collapse of the USSR (1991) and the accident at the Chernobyl nuclear power plant (1986) ("Kazakhstan is one step away from…", 2020; "Journalist: the current crisis…", 2020; Nosovich, 2020).

Thus, European and Western media are comparing the current situation with crises that took place 75 and 87 years ago, although there are very few eyewitnesses living today. But in the post-Soviet space, only representatives of generations born after 1995 do not have personal experience living in a powerful social and economic crisis (the period of "perestroika" after the collapse of the USSR). The rest of the adult population of the countries of the post-Soviet bloc has had personal experience in overcoming a large-scale crisis.

According to a recent study on the characteristics of anxiety during a pandemic by representatives of different age groups in Russia, "the youngest age group (18-24 years) is most vulnerable to the development of anxiety-phobic and depressive reactions. In the younger age group, the phobic components of anxiety predominate, while at the same time they are not associated with the fear of contracting infection. Their anxiety is probably a reaction to the general social uncertainty, since they had never experienced such crises before. Perhaps this is due to the fact that representatives of this generation were not faced, at a conscious age, with major crises across the country or around the world" (Kholodova, 2020). The researcher's conclusion suggests that the lack of experience with major crises among residents of Europe and Western countries correlates with a higher level of anxiety and tension, which was reflected in the responses by respondents.

The Impact of Migrant Status on Experiencing the Pandemic

Migrants, regardless their ethnicity, were less irritated by quarantine violators than people native to a country, and were more likely to understand them; they were more often indifferent to the actions of other people that did not directly affect them. They had a calmer attitude than the native population did. Migrants paid more attention to strengthening their own immunity, compared with the people native to a country, and believed more in themselves.

Compared with the native population, migrants were more willing to perform any work that was in demand, even if they did not like it. They were less likely than people native to a country to seek family support. They were also distinguished from native representatives by a stronger belief that everything will be fine in the future. To a greater extent than the people native to a country, they took care to protect their families from infection and for the most part followed the instructions for this reason. Their relations with people they were close to became deeper during quarantine, and they realized their need for communication through individual contact by phone or via mobile applications, in contrast to group communication in social networks, which was more preferred by the native population.

Uncertainty worried migrants more than it did people native to a country and prevented them from organizing their lives. To a lesser extent than the native population, they were ready to make important decisions for themselves or loved ones during quarantine. But compared with the native population, migrants felt less powerless. They followed the news less often than the people native to a country and did not often use extra hygiene measures. But they were more active than the native people, strengthened their immunity, and were engaged in self-improvement during quarantine.

The pandemic crisis has once again highlighted the enormous importance of the phenomenon of migration in today's world. "In the first decade of the 21st century, migration made a very significant contribution to the renewal of wealthy societies and, with a comprehensive assessment, this contribution will probably increase in the coming decades ... Thus, we are not talking about a marginal, residual and opportunistic phenomenon controlled by its transitivity, but, on the contrary, about the main and structural component of demographic, social and economic change" (Livi Bacci, 2012). At the same time, according to many researchers, today migrants are one of the most vulnerable segments of the population. "As in many other crises, migrants may be particularly vulnerable to the direct and indirect impacts of COVID-19. ... Many countries have responded to COVID-19 with increased closures, tighter immigration regulations, and further marginalization of migrants." (Guadagno, 2020).

However, despite their increased vulnerability, migrants have adopted an active stance toward life, this time in the face of a pandemic. According to the previously mentioned study that we conducted in 2019 on a sample of 143 Russian-speaking and foreign migrants living in Spain, one of the most important vectors of choice in favor of migration is to avoid a difficult life situation. But if the situation in the country of migration becomes critically problematic, many migrants decide to re-emigrate, that is, return to their home countries. Thus, according to some reports, tens of thousands of migrants from various countries have already returned to their

countries, such as immigrants from Kyrgyzstan and Moldova, Morocco and Venezuela, Britain and Romania ("Millions of Migrants Return to… ", 2020; " Labor Migrants Return to… ", 2020; " British Expats Head Home… ", 2020).

What helps migrants maintain the ability to remain "above the situation" in the face of a severe crisis? "... Cardinal breakdowns call into question not only life, but existence, the very existence of people in the world. Hence, apparently, the logical observation is that social crises are associated with personality crises, with questions about how to survive, about the meaning of existence. In the years of the break, as, for example, in Europe after the First World War, the relevant question was whether I will have a piece of bread, a roof over my head and any clothes in the cold.." (Grishina, 2019). The key concept in this context, in our opinion, is the presence of meaning that helps to overcome a difficult life situation. According to the ideas of Western authors, in particular P. Wong, the fear of death stems from the failure to find meaning in life, while the presence of meaning is associated not only with a positive attitude towards death, but also with psychological health (Bakanova & Gorkovaya, 2014).

Regardless of motivation, at the heart of any decision to migrate there is an overriding goal, either short-term or long-term, which is related to the satisfaction of one's own needs or assistance to loved ones. It is the presence of this goal that helps all immigrants overcome the so-called migration crisis: complex, multi-stage, and time-stretched (Acholegui Loizate, 2009). It can be assumed that, as in the case of the experience of living in a large-scale national crisis, the experience of living in this migration crisis lays the foundation for increased stress resistance, flexibility, and adaptability of migrants to rapidly changing life contexts.

Conclusion

1. Common to all representatives of this study's international sample were the ideas of international cooperation and universal responsibility for overcoming the pandemic. Also common was an emotional backdrop saturated with a state of anxiety.

2. Cultural factors had a strong influence on the experience of the pandemic situation. Respondents from different countries (non-Russian speakers) were very intolerant of dissent in the fight against the pandemic in general and against those who violate prescribed sanitary measures, in particular. In the pandemic situation, representatives of this group showed an increase in patriotism. The main resources for coping with stress were work and family, and an increased readiness for an operational response to the situation through a change of activity. Fear of death was frequently expressed. Coping strategies were rational-external.

The sample of Russian-speaking respondents showed great tolerance to the positions of other countries regarding the coronavirus, as well as to the position of those who did not comply with the prescribed sanitary standards. They expressed a desire to wait out the pandemic and quickly return to the usual way of life. Their main preventive measure was self-isolation, which was considered an opportunity for the development of something new and the pursuit of useful things. Despite the higher percentage of respondents experiencing personal crises due to the pandemic, the irrational belief that everything would soon be fine was a characteristic

strategy for coping with stress in this group. Their coping strategies were generally irrational-internal.

These differences may be due to 1) a difference in the ideological foundations of each group's mentality: a utilitarian-hedonistic one in the West versus the tradition of interpreting suffering as a stage of personality development in Russia, and 2) the recent collective experience of living under nationwide crisis conditions (collapse of the USSR) among Russian-speaking respondents versus the lack of such experience among European respondents.

3.   The perception of the pandemic by migrants differed from the perception of the situation by the native population by showing greater internal balance, self-confidence, confidence in a positive outcome, willingness to quickly respond to a new context, an internal locus of control, the ability to value life against the background of a deadly threat, and treating loved ones as a valuable resource and the object of care, instead of as a way to drown out a sense of alarm. Migrants were ready to take care of both relatives and themselves, and were interested not only in strengthening their immunity, but also in self-improvement. They were more tolerant of the opinions of other people. This position might be explained by their experience of the migration crisis, as well as their motivation for migrating, which reflected an orientation toward the meaning of life such as is necessary for successfully overcoming a crisis like this pandemic.

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Cognitive Emotion Regulation, Anxiety, and Depression in Patients Hospitalized with COVID-19

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Background. A number of studies from different countries have been devoted to studying the psychological state of patients during the COVID-19 pandemic. In addition to the severity of the symptoms of the disease itself, the situation of uncertainty can negatively affect the patients' psychological well-being.

Objective. Our research aimed to explore ways for patients with COVID-19 to regulate their emotional state during hospitalization, and how they can reduce symptoms of depression and anxiety.

Design. The research involved 127 people hospitalized due to confirmed COVID-19: 67 men (52.8%) and 60 women (47.2%), ages 19 to 77 years (M = 43.34, Me = 42, SD = 11.81). We used a set of questionnaires which included the Beck Depression Questionnaire; the Generalized Anxiety Disorder scale; the Perceived Social Support Questionnaire (22-item); the Cognitive Emotion Regulation Questionnaire; and the Dembo-Rubinstein self-assessment scales.

Results. Twenty-five and four-tenths percent (25.4%) of the participants had severe symptoms of anxiety, and 24.13% had symptoms of depression. Women showed higher symptoms of depression than men. ANOVA showed no significant differences in the use of emotion regulation strategies in patients being hospitalized at different intervals, or in patients of different age groups. Factor analysis made it possible to distinguish three patterns of emotion regulation: 1) adaptive cognitive change; 2) fixation on negative experiences; and 3) deflection of responsibility. Significant positive correlations were found between symptoms of depression and anxiety, and coping by fixation on negative experience only.

Conclusion. Although various means of cognitive emotion regulation by patients hospitalized with COVID-19 are currently being presented, these strategies are not associated with significant reductions in their symptoms of depression and anxiety.

Keywords: anxiety; depression; pandemic; COVID-19; regulation of emotion; coping with the disease

Introduction

The COVID-19 pandemic, which began in 2020, has clearly become a challenge for not only health professionals but all people, since all are directly or indirectly affected by quarantine measures and the threat of the disease to their daily lives. A large number of psychological studies have been devoted to studying the peculiarities of the response to the pandemic among residents of different countries and regions, including both those where the spread of COVID-19 took place rapidly, and those where the number of cases grew much more slowly. Most research has emphasized the emergence of symptoms of anxiety and depressive disorders at different stages of quarantine measures, as well as high levels of stress (Petzold et al., 2020; Wang et al., 2020). Meta-analysis data has shown an average depression rate of 33.7% and anxiety rate of 31.9% (Salari et al., 2020).

Social support, high personal self-efficacy, clear and understandable information on how to get help, lack of physiological symptoms, and lack of continuous monitoring of new cases (among other conditions), as well as adherence to certain preventive measures, have been identified as protective factors significantly associated with reduced anxiety (Domínguez-Salas et al., 2020; Petzold et al., 2020). A number of authors have noted that the severity of symptoms of depression and anxiety has not decreased during the pandemic and remains at a fairly high level (Wang et al., 2020). There is also evidence of a growing rate of suicide among both the total population and patients (Sher, 2020). In addition, studies have confirmed the generally known pattern of greater severity of symptoms of depression and anxiety in women than in men; the COVID-19 situation is not an exception (Petzold et al., 2020).

The study of COVID-19 responses among patients with a confirmed diagnosis is a special task for both the scientific community and practicing psychologists and physicians. However, even the meta-reviews of publications on the COVID-19 issue, which analyzed the response of the general population, vulnerable populations, and health workers, do not always contain information about what happened to the patients (Rajkumar, 2020). These meta-reviews include both overview theoretical articles and case analyses that assert the need for psychological support for patients with COVID-19. They also show that anxiety and depressive symptoms, common among hospitalized patients, in cases of COVID-19 can be enhanced by specific somatic sensations, such as respiratory insufficiency and cardiovascular complications, as well as by distance from social support (Epstein et al., 2020; Xiang et al., 2020).

At the same time, other authors note that, regardless of the success of medical protocols for treating COVID-19, psychological support of patients may reduce the severity of some somatic symptoms associated with the disease (Renjun et al., 2020). Chinese colleagues also talk about a possible link between patients' self-reported depression and an immune response; in this case, psychological support is especially significant, as it is potentially associated with the effectiveness of drug treatment (Yuan et al., 2020). There is also evidence showing the effectiveness of online training aimed at reducing anxiety and depression in patients with COVID-19 through the use of mindfulness techniques, breathing techniques, "refuge" skills (techniques for creating a safe space in the patient's imagination), and the

"butterfly hug method" (a physical technique aimed at reducing the intensity of emotions) (Wei et al., 2020). But many studies only assert the effectiveness of these techniques, without explaining their mechanisms.

In this regard, we have focused our study on analyzing the means of emotional regulation and coping with the disease being used by hospitalized patients; we also thought it important to investigate the relationship between the strategies used and the severity of symptoms of depression and anxiety. As the main construct, we selected the cognitive regulation of emotions model developed by Garnefski and Kraaij (2007).

Over the last decade, the study of emotion regulation as a separate psychological phenomenon has grown rapidly and become popular. This interest is largely due to the fact that most authors agree that the regulation of emotions is an important link in the preservation and restoration of mental health (Gross, 2013; Sapolsky, 2007). In its most general form, emotion regulation can be defined as "external and internal processes responsible for collecting, evaluating and changing emotional responses, especially their intensity and length over time in order to achieve certain goals" (Thompson, 2008). From the point of view of Garnefski and her colleagues, such a wide definition includes both coping strategies and controlling behavior. Within Garnefski's model, the division of coping strategies into behavioral and cognitive seems more appropriate than classification of "effective" - "not effective" or "emotionally oriented" - "problem-oriented," since thought processes and behavior are different processes occurring at different points in time (Garnefski, Kraaij, & Spinhoven, 2000).

In researching how hospitalized patients respond to COVID-19, it seemed reasonable to concentrate on the precise cognitive methods they used to regulate their emotional state, since the very fact of hospitalization in connection with an infectious disease places a person in conditions where the implementation of many familiar behavioral coping strategies (for example, seeking help from a specialist; sports and physical activity; travelling; meeting with friends; massage or bath, etc.) is impossible. In this regard, cognitive strategies turn out to be the "first line of defense" that helps a person survive and accept having a serious and unknown disease.

Therefore, the focus of our attention was the study of the main strategies for cognitive regulation of emotions. We identified the following strategies: self-blame; acceptance; rumination; positive refocusing; refocus on planning; positive reappraisal; putting into perspective; catastrophizing; and blaming other patients with COVID-19 and their correlations with the symptoms of depression and anxiety.

A meta-analysis of modern experimental studies of various strategies of emotional regulation has shown that it is impossible to draw an unambiguous conclusion about which strategies for emotional regulation work and which do not (Gross & Thompson, 2007). Strategies that have been successful in one case may not lead to success in another, so it is always necessary to evaluate them in the context of a specific situation, and judge how much of the emotional response corresponds to what is happening, and whether another more adaptive reaction is possible in the situation. This explains why currently it is extremely important to consider the patients' existing strategies specifically in relation to the COVID-19 pandemic: the fact that a previous pattern of emotion regulation helped to successfully cope with stressful events does not mean that this pattern will be productive in this pandemic.

Methods

Participants

Our study involved 127 respondents (52.7% men, 47.2% women) who voluntarily agreed to participate in the research. The age of participants was from 19 to 77 years, (mean age 43.34, median age 42, standard deviation 11.91). All participants were hospitalized due to a confirmed diagnosis of COVID-19 at the University Hospital of Sechenov University and had been in the hospital for 10-14 days at the time of participation in the study. All participants lived in Moscow. Unfortunately, we do not have additional medical data on the severity of symptoms, comorbidities, etc.

Materials

Questionnaires

1. The Beck Depression Inventory-II (BDI-II) (Beck, Steer, & Brown, 1996) in Russian adaptation by Tarabrina (Tarabrina, 2001). BDI-II was designed to assess the presence and severity of depressive symptoms in a patient over the previous 14 days. The questionnaire consists of 21 statements, with each answer being scored on a scale of 0 to 3; total scores thus range from 0 to 63. Values from 0 to 13 mean no depression\minimal depression; 14 to 19, mild depression; 20 to 28, moderate depression; and 29 to 63, severe depression (according to international cut-off scores). The test has high internal consistency ($\alpha = 0.86$) (Tarabrina, 2001). We also separately assessed scores on cognitive-affective and somatic sub-scales as part of this questionnaire (internal consistency $\alpha = 0.79$ for both sub-scales).

2. The Generalized Anxiety Disorder scale (GAD-7) (Spitzer, Williams, & Kroenke et al., 2006). This scale measures the severity of anxiety symptoms in patients over the previous two weeks. Answers to each item are scored from 0 to 3 points, with total scores ranging from 0 to 21. Scores from 0 to 4 points indicate the minimum level of anxiety; 5 to 9, moderate; 10 to 14, medium; and m 15 to 21, a high level of anxiety, according to international cut-off scores (Spitzer, Williams, & Kroenke et al., 2006). The internal consistency of the GAD-7 is also high ($\alpha = 0.92$)

3. Perceived Social Support Questionnaire (F-SOZU-22) (G. Sommer & T. Fydrich, 1993) in Russian adaptation by Kholmogorova, Garanian, and Petrova (2003). This questionnaire measures general perceived social support with a 5-point scale ranging from 1 (not true at all) to 5 (very true). We used scales of social support and satisfaction with received social support. The minimum and maximum scores on the first scale are 12 and 60, respectively (12 questions included); and on the second, 2 and 10 points, respectively (2 questions included). The internal consistency of the F-SOZU-22 was $\alpha = 0.89$.

4. Cognitive Emotion Regulation Questionnaire (CERQ) (Garnefski & Kraaij, 2007), in Russian adaptation by Rasskazova, Pluzhnnikov, and Leonova (2011). We asked respondents to answer about how they cope with the difficult situation of hospitalization due to COVID-19. The questionnaire emphasizes the following scales: self-blame, acceptance, rumination, positive refocusing, refocus on planning, positive reappraisal, putting into perspective, catastrophizing, and blaming others. The questionnaire consists of 36 statements (4 items for each scale). The answer to each question is given on a 5-point scale: 1 = never and 5 = almost always. Scores on each of the 9 scales range from 4 to 20. The internal consistency (Cronbach's alpha) for different scales varies from 0.74 to 0.83.

5. A modified version of the Dembo-Rubinstein technique, which included such scales as health (DR Health), luck (DR Luck), stress tolerance (DR Stress tolerance), happiness (DR Happiness), and sociability (DR Sociability) (Rubinshtejn, 2010).

In this version of the technique, the subjects were asked to evaluate the severity of the presented qualities on a 10-point scale, where 1 = completely absent and 10 = present as much as possible. The instructions called for the patient to answer one question for each scale. Here are sample scales that assess the parameters of well-being or personality traits that are important for each person: "Imagine that all people on Earth are placed on these scales, and people with the lowest intensity of this quality are located at rating 1, and people with the highest severity are at 10. Please determine your place on these scales." The scores on each scale ranged from 1 to 10.

6. The socio-demographic survey, which included questions about age, sex, education, subjective severity of symptoms, and satisfaction with the quality of care, as well as about the needs for other forms of assistance (work with a psychologist, priest, closer contact with a doctor, etc.).

Procedure

Patients who had been at the clinic between 10 and 14 days were asked to fill out an online form (using Google Forms service); a link to the form was sent to the mobile phone of those who agreed to take part in the research. Participation in the study was voluntary. All participants completed the proposed questionnaires anonymously. Patients were advised that participation in the study would not affect the quality of the care they received., The participants did not receive feedback on the results of the study, but were informed about the possibility of seeking psychological help on the helpline.

We conducted our research between April 25, 2020 and May 31, 2020. At that time, strict self-isolation measures were already in force in the city of Moscow (work and studies via remote format), and patients and members of their families had to stay at home and regularly confirm their location using an online application. For hospitalized patients, such self-isolation meant the impossibility of communicating with relatives and friends face to face and sharing items with each other, as well as having a more limited contact with medical personnel (shorter in time; wearing mask and protective suit), who, according to the instructions, had to wear special protective clothing

We identified three periods of hospitalization: the First Stage was from April 25 to May 1; the Second Stage from May 1 to May 12; and the Third Stage from May 12 to May 31. We were guided by the following reasoning: 1) Because workers in Russia traditionally get several days off between May 1 and 12 due to public holidays, which often involve a large number of mass events (mass holidays, trips with family and friends), this period was important for assessing the severity of depressive and anxiety disorders for those patients whose hospitalization occurred on these weekends; 2) Patients hospitalized during the early stages of the pandemic reported a greater level of uncertainty and less understanding of the health system in the questionnaire. We assumed that an early date of hospitalization would be asso-

ciated with greater difficulty in orienting in a stressful situation and using other coping strategies than if they were hospitalized at the end of the research period, which was right before quarantine measures were removed. During the first stage, 15 patients were interviewed (11.8% of participants); during the second, 70 people (55.1% of participants); and during the third, 42 people (33.1% of participants).

We divided the study participants into groups by gender: 52.7% of participants were men and 47.2% were women.

We also identified three age groups: 19–35 years old (32 people, 25.2% of participants); 35–50 years old (65 patients, 51.2%); and 50–77 years old (30 people, 23.6% of patients).

Results

Table 1 provides descriptive statistics of the main parameters: the symptoms of depression and anxiety; level of social support; and the Dembo-Rubinstein technique in the general sample, all divided between men and women.

Table 1

Descriptive statistics

	M/SD	**M/SD Male**	**M/SD Female**
Depression	7.48/6.02	6.32/6.2	8.77/5.59
Somatic sub-scale	4.01/3.25	3.07/3.09	5.07/3.13
Cognitive-affective sub-scale	3.72/3.77	3.46/3.87	4.02/3.67
Anxiety	4.75/5.41	4.37/5.82	5.18/4.92
Social support	39.14/6.91	38.11/7.84	40.03/5.54
Satisfaction with social support	6.23/2.31	5.85/2.04	6.67/2.15
Dembo-Rubinstein scales			
DR Health	7.22/1.73	7.55/1.68	6.85/1.73
DR Luck	6.93/1.91	6.94/1.99	6.93/1.83
DR Stress tolerance	7.12/2.05	7.46/1.95	6.75/2.13
DR Happiness	7.65/2.14	7.78/2.25	7.52/2.02
DR Sociability	7.69/2.07	7.85/2.44	7.52/1.86

It is important to note that the average level of symptoms of anxiety based on cut-off scores exceeded the minimum values and fell into the group of "moderate" anxiety. Thus, 25.4% of respondents show moderate or higher levels of anxiety; 11.43% had a high level of anxiety; 24.13% had a mild level of depression or higher (also based on cut-off scores), and 6.35% of all participants had symptoms of moderate depression.

Table 2 shows the main descriptive statistics of cognitive emotion regulation strategies.

Table 2

Descriptive statistics

	M	SD
CERQ Self-blame	10.17	4.29
CERQ Acceptance	12.75	3.38
CERQ Rumination	9.22	3.8
CERQ Positive refocusing	13.38	3.91
CERQ Refocus on planning	12.48	3.33
CERQ Positive reappraisal	13.18	3.95
CERQ Putting into perspective	11.97	3.48
CERQ Catastrophizing	7.7	2.96
CERQ Blaming others	7.59	3.55

As can be noted from *Table 2*, all available strategies are represented to one degree or another, showing that all of them were used by different patients to cope with the situation of the disease. We performed a factor analysis using the main components with orthogonal Varimax rotation. Factors were extracted based on eigenvalues greater than 1. The resulting factor solution explained 69% of the dispersion. The results of the factor analysis are shown in *Table 3*.

Table 3

Factor analysis

	Component		
	1	2	3
CERQ Refocus on planning	0.836		
CERQ Positive reappraisal	0.791		
CERQ Putting into perspective	0.701		
CERQ Positive refocusing	0.685		
CERQ Acceptance	0.619		
CERQ Rumination		0.865	
CERQ Catastrophizing		0.745	
CERQ Self-blame			-0.537
CERQ Blaming others			0.905

Internal consistency was assessed for each of the factors using the Cronbach's alpha calculation (0.782, 0.669, and 0.801, respectively). This way, we were able to single out three patterns of emotional coping strategies. The first one we named "adaptive cognitive change," which is characterized by the use of strategies such as refocusing on planning, positive reappraisal, putting into perspective, positive refocusing, and acceptance. We named the second pattern "fixation on negative experiences;" the most characteristic uses of this strategy are rumination and catastrophizing. The third category was "deflection of responsibility," and was characterized by the use of prosecution strategies — self-blame and blaming others.

Then we compared the different groups of participants according to the parameters studied in *Table 1*. Significant differences between the male and female groups were obtained using Student's t-distribution. The presence of statistically significant differences suggested that women have higher symptoms of depression than men (t = –2.31, p-value < 0.05), as well as the somatic component of depression (t = –3.4, p-value < 0.01). Moreover, women were more satisfied than men with the social support they received (t = –2, p-value < 0.05); also they assess their health lower than men, (t = 2.31, p-value < 0.01). No differences between men and women were found in the use of the emotion regulation patterns we identified, or in the use of individual strategies.

It is very important to emphasize that ANOVA showed no statistically significant differences between participants of different age groups. We initially assumed that both the emotion regulation strategies and the specifics of social support and anxiety (including about one's health) would differ in people of different ages.

An ANOVA test was performed for each of the three factors during the different time periods. Significant differences were obtained only for factor 1, adaptive cognitive change (F = 4.793, p = 0.01). A Tamhane post-hoc test showed significant differences between stages 1 and 2, as well aso between stages 2 and 3 (0.0027 and 0.0031 respectively). Also ANOVA confirmed significant differences in strategies of cognitive emotional regulation between groups of respondents hospitalized at different stages of the pandemic. The use of such emotion regulation strategies as refocus on planning and positive reappraisal significantly increased when we moved to each new time period (*e.g.,* refocus on planning went from M = 10.66, to M = 12.24, to M = 13.54; positive reappraisal went from M = 12, to M = 12.55, to M = 14.66).

Table 4

Correlations between factors

	Depression	Cognitive-affective sub-scale	Somatic sub-scale	Anxiety
Adaptive cognitive change	–0.197[*]	–0.111	–0.259[*]	–0.111
Fixation on negative experiences	0.311[**]	0.211[*]	0.345[**]	0.350[**]
Deflection of responsibility	0.178[*]	0.122	0.219[*]	0.012

*Note. ** means p-value <0.01; *means p-value <0.05,*

We performed correlation analysis using the Spearman coefficient between the three patterns of emotional coping strategies and the symptoms of depression and anxiety. Regression coefficients were used as factor estimates. The results are shown in *Table 4.*

Thereafter, significant positive correlations were found between symptoms of depression and anxiety and coping with fixation on negative experiences (this is also true for the cognitive-affective component of depression). For other strategies, associations with symptoms of anxiety and depression were not significant.

Next, we performed a correlation analysis using Spearman's rank correlation coefficient to estimate the association between the social support, Dembo-Rubinstein sub-scales, emotion regulation strategies, and symptoms of depression and anxiety. The results are shown in *Table 5.*

Table 5

Correlations between scales

	Depression	Somatic sub–scale	Cognitive–affective sub–scale	Anxiety
Social support	−0.302[**]	−0.289[**]	−0.263[**]	−0.136
Satisfaction with social support	−0.138	−0.061	−0.194[*]	−0.134
CERQ Self-blame	0.007	0.003	−0.009	0.072
CERQ Acceptance	−0.017	0.0008	−0.015	0.07
CERQ Rumination	0.348[**]	0.271[**]	0.342[**]	0.458[**]
CERQ Positive refocusing	−0.278[**]	−0.180[*]	−0.330[**]	−0.221[*]
CERQ Refocus on planning	−0.136	−0.078	−0.181[*]	0.072
CERQ Positive reappraisal	−0.280[*]	−0.208[*]	−0.313[**]	−0.133
CERQ Putting into perspective,	0.026	0.044	−0.018	−0.039
CERQ Catastrophizing	0.226[*]	0.122	0.270[**]	0.186[*]
CERQ Blaming others	0.207[*]	0.136	0.257[**]	0.077
DR Health	−0.396[**]	−0.454[**]	−0.265[**]	−0.103
DR Stress tolerance	−0.440[**]	−0.441[**]	−0.368[**]	−0.346[**]
DR Happiness	−0.416[**]	−0.409[**]	−0.321[**]	−0.251[**]
DR Sociability	−0.307[**]	−0.317[**]	−0.260[**]	−0.183[*]
DR Luck	−0.331[**]	−0.276[**]	−0.356[**]	−0.036

Note. ** *means p-value <0.01, n=127; * means p-value <0.05, n=127*

Note that the severity of symptoms of depression was positively associated with the use of an emotion regulation strategy such as rumination, and negatively associated with the use of strategies such as positive refocusing and positive reap-

praisal. Also, the severity of symptoms of depression was negatively associated with perceived social support, as well as with all the scales in the Dembo-Rubinstein technique: the more points on the depression scale, the less healthy, lucky, stress-resistant, happy, and sociable respondents would see themselves. It is also important to note that these patterns were valid for both somatic and cognitive-affective components. The severity of the symptoms of anxiety was also positively associated with the use of a rumination strategy to cope with COVID-19, and negatively associated with the assessment of oneself as less stressful.

Discussion

Our data suggest that symptoms of depression and anxiety are indeed characteristic of hospitalized COVID-19 patients. These traits are significantly associated with patients' perceptions of being less healthy, fortunate, and happy, and more stressed. The prevalence of these traits in our series of results turned out to be less than in other papers (Salari et al., 2020), which may be due to less severe COVID-19 symptoms in our patients, or to delayed symptoms of depression and anxiety (since the patients assessed their condition only 10-14 days after hospitalization and diagnosis, they may have shown more symptoms later on in their disease).

Our results showed that the severity of depression and anxiety symptoms among hospitalized COVID-19 patients was positively associated with the use of emotion regulation strategies aimed at fixation on negative experiences, rumination, and catastrophizing. These results are supported by a number of other studies (Garnefski et al., 2002; Koole et al., 1999). At the same time, the use of other strategies, such as deflection of responsibility and adaptive cognitive change, did not reduce the severity of depression and anxiety at a statistically significant level.

According to other studies, strategies such as putting into perspective, positive reappraisal, and refocusing on planning are associated with a significant reduction in the severity of depression, anxiety, and stress (Martin & Dahlen, 2005; Garnefski et al., 2002). As we have already noted above, it is not legitimate to say that strategies are effective without taking into account the context in which they are being implemented. And in a situation of emergency hospitalization with COVID-19, according to our data, these strategies are rather unproductive in coping with depression and anxiety.

Our initial hypothesis stating that the regulatory strategies used would differ among research participants of different ages was not confirmed. Coupled with our finding that there are no significant differences in the use of certain regulatory strategies between men and women, we can say that the patterns of emotional coping strategies are primarily due to the emergence of a new, unknown disease (COVID-19) rather than being related to the previous experience of the respondents.

The lack of differences in intensity of the majority of the strategies used by the hospitalized patients at various stages of the pandemic, and the negative correlations between these strategies and the severity of depression allow us to assume that there are still no unambiguous and clear ways to cope successfully with news of a COVID-19 diagnosis. Now the task of finding such ways of coping and imple-

menting psychotherapeutic programs that help patients deal with hospitalization and the fact of their illness falls to clinical psychologists and psychiatrists. When preparing such programs, one can also take into account the fact that a number of the strategies included in the "adaptive cognitive change" pattern nevertheless become more common in the later stages of the the studied period. Perhaps, after the general uncertainty in society caused by the COVID-19 pandemic diminishes, these strategies will become promising in coping with the disease.

Our results on the differences between the male and female participants coincide with the data of foreign colleagues and with general trends: women expressed more symptoms of depression (Cavanagh, et al., 2017). The fact that women rated their health as more severe turned out to be quite interesting. A number of authors (Racine et al., 2012) indicate that women have lower sensitivity to pain, somatic manifestations, and symptoms of bodily discomfort. Other studies show that women tend to report more physical symptoms than men (Barsky et al., 2001; Van Wijk, C.M.T.G., & Kolk, A.M., 1997). Unfortunately, due to certain limitations, we did not conduct interviews with patients after using the Dembo-Rubinstein technique. Therefore, we do not know what criteria the patients relied on when assessing their well-being according to the "Health" sub-scale. However, we found no data describing differences in the subjective experience of COVID-19 symptoms between women and men.

Our results on social support coincide with data from other studies. Such support is more associated with a reduction in depressive symptoms than instrumental support is (Gariépy et al., 2016; Yoo et al., 2017). But, when talking about the situation with COVID-19, it is important to understand that social support cannot, and should not, become the key protective factor against depressive symptoms for patients. This is primarily due to the fact that for patients under quarantine, and hospitalized in isolation chambers, access to potential support from relatives and patient-care specialists is necessarily sharply limited: mobile phone and Internet access become the only ways to receive such support.

Conclusion

It is obvious that the very existence of the COVID-19 pandemic has greatly transformed the routine of a resident of the metropolis and imposed a number of complex and unusual restrictions. For those who at this moment are not only witnesses to the pandemic, but also sick, the situation seems even more difficult. Our study showed that patients with COVID-19 have symptoms of depression and anxiety, which is consistent with data from patients from other countries; women show symptoms of depression more than men.

The patterns of emotion regulation strategies most commonly used by our respondents to cope with the disease, turned out to be insufficiently effective in relieving symptoms of depression and anxiety; the pattern called "adaptive cognitive change" was only marginally associated with a decrease in symptoms of depression and anxiety. To the contrary, one of the identified factors — fixation on negative experiences — significantly impaired a patient's psychological well-being. This means that, since the beginning of the pandemic and despite the rather long duration of the research, the patients have not had highly effective ways available to cope with

what is happening to them. This challenges specialists, doctors, and psychologists with the task of developing psychological support programs for COVID-19 patients and their loved ones. We assume that such programs in general can be aimed at reducing the use of strategies included in the patterns "deflection of responsibility" and "fixation on negative experiences," and strengthening and practicing the strategies included in the pattern "adaptive cognitive change."

In further studies, it seems important to continue to highlight buffer factors that prevent the formation of depressive and anxious reactions to the disease, as well as to study the formation of the most productive strategies for regulating emotional states in this particular situation.

Limitations

Our research was conducted at a Moscow clinic, and all respondents who took part in the work lived in Moscow. This makes it difficult to apply the data obtained to a larger sample and does not allow us to conclude how residents of other cities might cope emotionally with the COVID-19 situation. Due to the remote format of the study (by internet), we have no data on the severity of the patients' somatic symptoms. This prevents us from investigating the important relationship between a patient's physical condition and the severity of his or her symptoms of depression and anxiety.

Also, the number of participants in the three groups of patients hospitalized at different stages of the pandemic turned out to be unequal due to organizational limitations in the work of clinics. This also does not allow us to unambiguously generalize the results obtained.

According to our assumptions, another possible important limitation is that the patients who agreed to undergo the online research felt significantly better physically than those who, for health reasons, could not take part in the survey. This may mean that the patterns of coping with the disease identified by us are fair only for those patients who, on the one hand, have enough physiological symptoms for hospitalization, but, on the other hand, feel good enough for voluntary participation in psychological work. Therefore, we cannot unequivocally assert how asymptomatic patients or patients with severe symptoms of COVID-19 are dealing with the disease.

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Psychological and Ethnocultural Sensitivities in the Perception of COVID-19 Memes by Young People in Russia and China

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Background. The COVID-19 pandemic has brought dramatic changes to all spheres of life. These changes have triggered an immediate response from the media, including social media, which repeatedly posts not only up-to-date information about this most relevant issue, but also users' reactions to it, including Internet memes.

Objective. The research presented in this article focused on comparing the psychological and ethnocultural sensitivities in the perception of COVID-19 memes by young people in Russia and China.

Design. The selected sample contained 108 respondents (n = 108), comprised of 50 Chinese and 58 Russian university students. The study consisted of two procedures: a survey and a student's t-test on the perception of specific Internet memes.

Results. The main results were that memes which evoke a positive response from the respondents and cheer them up were scored the highest. Such qualities as relevance, kindness, cheerfulness, creativity, meaningfulness, and thought-provoking ability were rated high. Each group of respondents gave a higher score to "our own" memes and a lower score to the other group's memes. It is generally typical of the Chinese to have a more positive perception of reality. We ascertained a tendency towards polarization of opinions and focus on individualization among the Russian respondents, whereas the Chinese respondents strove for orderliness and consensus.

Conclusion. As a whole, COVID-19 memes in such ethnoculturally different audiences as the Russians and Chinese serve a compensatory function for young people, helping them overcome the hardships of the pandemic through the memes' relevance and creative character.

Keywords:
COVID-19
pandemic;
media; Internet;
memes;
perception;
young audience

Introduction

The COVID-19 pandemic has brought dramatic changes to all spheres of life. These changes have triggered an immediate response from the media, including social media, which repeatedly posts not only up-to-date information about this most relevant issue, but also users' reactions to it, including Internet memes (Pestova & Safonov, 2020). "How the epidemic messages affect the public sentiment is an important issue with both theoretical and practical value" (Fang & Haochen, 2020, p. 40).

A certain combination of text, cultural cliches, perceptions, and standard symbols capturing a kind of content, exists in the minds of people who share the same language and history. Together they form the cultural memory of common language speakers, what could be called "invariant images of the world" (Leontiev, 1997), without which no communication system could exist. The immense impact of the media in the current spread of the new coronavirus epidemic situation is evident: "...the news media should bear the responsibility of connecting society, fulfilling the basic responsibilities of the media, serving the people, and helping to scientifically regulate anti-epidemic measures" (Baowei & Xinning, 2020, p. 10).

The conditions in which the media discourse takes shape are related, first, to the globalization of information exchange, which has overcome borders between countries, peoples, and ethnicities, and at the same time, led to more complex relationships and people's growing desire for self-identification and assertion of their status in a globalized world, including through information technology. Also, we cannot ignore the fact that the information system is changing dramatically, acquiring completely new characteristics, such as polysemanticity, duality, polycoding, simultaneity, virtualization, transboundariness, discreteness, etc. These specific features are combined with the ability of information to spread quickly, much like virus systems, in non-equilibrium transient states; reach a large audience (publicity factor); and thus become an independent economic, social, and psychological resource that affects the processes of material and spiritual exchange.

As a negative trend, it may be noted that present-day research into media discourse is becoming culturally monological, rather than dialogical and diversified (Shi-xu, 2009; Shi-xu, 2016). There is a growing, urgent need to employ cross-cultural and interdisciplinary methods in discursive research, which would allow the most effective demonstration of the unique cultural heritage and intellectual achievements reflected in local media discourses.

It is important to note that the rapid spread of memes in recent years, and their noticeable impact on their audiences (especially young audiences), are attributed to their viral nature and their ability to embed themselves in human consciousness, serving the function of providing cultural patterns in communication (An, Cong, & Wang, 2004). In this respect, memes are a very important target for psychological, ethno-psycholinguistic, and sociological research.

In this paper, we consider the Internet meme to be a specific type of online message that brings together brief statements, different in their genres and semiotic nature, on topical issues which, due to their semantic scope and visual images, have a "viral nature;" meet the criterion of perceptual markedness (that is, they possess the intensity of information influence); and require appropriate perception by the addressee (Castaño, 2013; Wiggins & Bowers, 2015; Shomova, 2018; Denissova,

2020). We have selected "creolized memes" (Sorokin & Tarasov, 1990; Kartashova & Akhmedzianova, 2019) for our analysis, because this particular type of meme exerts influence through correlation between the visual imagery and the recipient's experience of it as a national culture bearer.

Background

Back in 1998, Bekhterev (1999) introduced the concept of "mental microbes," which did not become very popular until mass media became widespread. The globalization of information has revolutionized communication, and led to formal written speech gravitating toward oral communication, on the one hand, and its "meme-ization" (Krongauz et al., 2017), on the other.

The term *meme* was introduced into scholarly discourse in 1976 by British evolutionary biologist Richard Dawkins (1976; 1997), who used it to describe a unit of cultural information spread by imitation and replication. Later, researchers offered other interpretations of this concept, including one that defines the meme as a synonym for cultural replication on a representative basis, comparable to symbols and associations (Sperber, 1996). Another interpretation suggested that memes are ideas or representations, "the internal end of the knowledge relationship" (Plotkin, 1993). The emphasis was on the variability of memes as their key feature, as well as on their destructive effect on human consciousness, and their ability to influence people's actions (Dennett, 1995).

The phenomenon of Internet users turning into "memeboids," *i.e.,* people who copy and replicate someone else's texts instead of generating their own, and thus pass on *someone else's* information, has been extensively studied (Ksenofontova, 2009). There has also been a focus on memes as cultural viruses, the memetics of religion, cult creation, and even the disinfection of society; the main means of meme distribution are being researched, such as repetition; cognitive dissonance, for the resolution of which new memes are introduced; genetic response, etc. (Brodie, 1996; Lynch, 1996).

Initially, the term *meme* was not related to computer technology; however, Douglas Rushkoff (1994), who studied the effect of pop culture on the mind, understood memes as containing hidden agendas and an ideological code that can infiltrate our mediasphere through the spread of seemingly innocuous cultural messages. He also introduced the term *media virus* and, building on Dawkins' work, described how media viruses are conceptually linked to biological ones, although media viruses spread through the datasphere instead of the body or community. "Instead of traveling along an organic circulatory system, a media virus travels through the networks of the mediaspace," he wrote. In addition, Rushkoff emphasized that "Once attached, the virus injects its more hidden agendas into the datastream in the form of ideological code — not genes, but a conceptual equivalent we now call 'memes'" (Rushkoff, 1994, p. 9-10).

The term *meme* was first used to mean a piece of culture, typically a joke, which gains influence through online transmission and functions online (Davison, 2012). Later on, the idea of techno-memes that are spread with people's participation but without any rational purpose on their part also appeared (Blackmore, 2010). So, the meme appears to be an essential part of Internet communication, and the interpretation and understanding of the meme continue to be the focus of research. Some

researchers, for example Mikhail Epshtejn (2006), interpret the spread of "memes" as one of the main functions of a language (Chaoqun, 2007; Yunhui, 2010; Meiying, 2010); hence the importance of studying the psychological and ethnocultural factors influencing the choice of memes and their replication.

However, our study also had the objective of understanding the functioning of memes as a way to address the problem of maintaining health through the use of modern media. In general, recent trends show that the media are getting more and more interested in health topics; the events related to the 2020 COVID-19 pandemic have had a clearly dramatic impact on these trends, changing the approaches to this topic. Researchers have already started to assess these processes in terms of mediatization. Media research experts also emphasize that the most important factor that brought the issue of healthy living to the media forefront, is the dramatic change in the structure of the information and communications technology space which has taken place over the last few years (Vartanova, 2019).

Researchers in the field of psychology note that such a global challenge as the COVID-19 pandemic has increased health risks: some affected individuals have been reported to exhibit mental health problems, including stress, anxiety, depressive symptoms, fear, denial, and anger (Kang et al., 2020). Indeed, the level of stress that people all over the world have experienced, and are still experiencing in these new circumstances, is difficult to compare with any public health challenges that have ever existed. In its turn, this crisis cannot but lead to serious consequences, such as impairing individuals' immune systems (Tao, 2006), negatively impacting daily life, and reducing wellbeing (Holbrook et al., 2005), among others. In particular, researchers find it important to analyze the mental state of people from different age groups under such conditions, including students (Jieling et al., 2014), and the potential aggravation of students' psychological distress during the COVID-19 outbreak (Xiao & Benxian, 2020).

To understand the role of the media as a tool that individuals can use to cope with the stresses caused by events such as the pandemic, earlier research on different aspects of the problem has been useful (Green & Rodgers, 2001; Martire, Stephens, & Townsend, 1998; Gadalla, 2009; Assari, 2019; Bennetter, Clench-Aas, & Raanaas, 2016; Keeton et al., 2008).

Social support would be associated with reduced acute stress symptoms, which are viewed by researchers as a common mental health problem in the period following the COVID-19 outbreak (Xiao & Benxian, 2020).

In this context, we believe that the study of the impact of different types of media content on people's psychological state is extremely relevant. There is almost no cross-cultural research on this issue yet. Therefore, it is very important to understand the ethnocultural sensitivities in the perception of this media content by recipients from countries with radically different cultural experiences, such as Russia and China. This is the subject our study addressed.

The purpose of our study was the research of to explore the psychological and ethnocultural sensitivities in the perception of Internet memes related to the COVID-19 pandemic by young people in Russia and China. The subject of the memes was chosen because the pandemic issue is now at the top of people's agendas; moreover, the choice of Internet memes with a single subject will allow us to identify differences in their perception by different audiences more effectively.

The main issues of the questionnaire (Zinchenko, Shaigerova, & Soldatova, 2016; Zizevskaia & Shchukina, 2018) we used touched on various ethnic and socially significant aspects of human behavior related to the impact of memes on people's psychological condition during self-isolation. The questionnaire addressed various ethnic and socially significant aspects of human behavior. We chose a young audience as the target of our research because of the importance of media consumption by present-day youth. Researchers emphasize that the Internet is an extremely important and habitual source of information for young people (Vartanova, Cherevko, Tolokonnikova, & Dunas, 2019). They also stress the need for studying such important processes as socialization and self-actualization in the media practices of youth involved in digital media culture (Dunas & Vartanov, 2020).

From an ethno-psycholinguistic perspective, it appears that the Internet meme is not well understood as performing the function of expressing a cultural pattern in communication and being integral to the manifestation of an ethnocultural identity. In this regard, studies focused on the aspects of mutual understanding when interpreting the same phenomena by speakers from different languages/cultures become increasingly important, since memes from different nations may differ in their degree of structural complexity and accuracy of reflecting reality. Therefore, it is important to:

1. Identify the psychological and ethnocultural sensitivities in the perception of "native" Internet memes, and carry out a comparative analysis of the perception of Chinese memes by Russian respondents and Russian memes by Chinese respondents; and

2. Identify the psychological and ethnocultural sensitivities in the perception of "non-native" Internet memes, and carry out a comparative analysis of the perception of Chinese memes by native Russian speakers and Russian memes by native Chinese speakers.

Research hypothesis: Although a meme is the result of frame processing and complex thinking by the human mind (and in this sense, it has a lot in common with percepts, gestalts, symbols, etc.), and its perception is determined by the recipient's ethnocultural identity, COVID-19 memes also equally serve a compensatory function for both Russian and Chinese youth audiences, helping them overcome, through their relevant content and creative form, the hardships of the pandemic and the negative effects of self-isolation, restricted freedom of action, and the lack of face-to-face communication.

Methods

Participants

Our sample contained 108 respondents (n = 108), including 50 Chinese and 58 Russian university students (both Humanities and Engineering), enrolled in different degree programs: bachelor's (42%), master's (32%), and postgraduate (26%). It included 36% men and 64% women. Respondents' age groups were: 18 to 22 years old (39%); 23 to 27 years old (46%); and 28 to 32 years old (15%).

Our study began on April 1, 2020, during the COVID-19 outbreak. We focused on university students, because all the universities in both countries were closed in order to reduce the likelihood of teachers and students becoming infected with the virus. Students were studying from home during this period. During the survey (April-June 2020), all the respondents were in self-isolation. All 58 Russian respondents were students of various universities in Moscow, but at the time of the survey, they were both in Moscow and in 18 other Russian regions (one student even had an internship at a university in Belgium). Out of the 50 Chinese respondents, 14 people were outside China (most of them were in Russia, and one student was in the U.S.), and 36 people were in 25 cities of China, spread over 16 provinces.

All schools and universities in both China and Russia were closed until September 2020, and students took online classes. The movements of students on campus were severely restricted. China introduced unprecedented and very strict measures to contain the virus. As part of these measures, starting in February, each and every student in China had to report his/her location and health status on a daily basis, using a special mini application in WeChat. The borders of both China and Russia were closed starting March 28, 2020, and are still closed.

We conducted an Internet-based survey to assess psychological responses among students. Using the emailing platform, we sent a questionnaire to some students and invited them to respond and invite their friends who were also students to respond. Using this method, we recruited 108 participants in several regions in Russia and provinces in China.

Procedure

The study consisted of two procedures. The first one was a survey among respondents about their attitudes towards Internet memes related to the COVID-19 pandemic. The questionnaire included basic questions about the social media used by the respondents and their functions (entertainment, distraction, emotional experience, communication, identification, information, compensatory and contact functions); respondents' preferences for different types and topics of memes; and the perception and influence of memes on the respondents. The topics and wording of the questions aimed to identify the role of memes and their impact on the respondents' psychological condition during the coronavirus pandemic and self-isolation.

The second procedure involved a test on the perception of specific Internet memes by the respondents. We selected a sample from popular memes oin the Russian and Chinese Internet sectors. The memes were selected as follows: for one month (15 April 15 — 15 May 15, 2020), 10 student volunteers students from Moscow State University (5 Russian nationals and 5 Chinese nationals) monitored their social media to find pandemic-related memes. The main criteria for selecting the memes were their relevance and a high level of popularity among the audience (a significant number of likes). As a result of such the monitoring, we have removed duplicating memes and compiled an array (N = 400), including N=200 Russian memes and N=200 Chinese memes. After that, we selected the creolized memes, — that is, those with an image (photos, drawings, paintings or mixed forms) and a text —, since the creolized meme is a kind of universal code capable of recoding into the areas of both language and thought (N=267). Preference was given to clear,

easy-to-understand images with large and concise text, accessible to both the Russian and Chinese audiences.

In addition, the selected memes showed different objects such as people, animals, nature, symbols, etc. in different forms, including realistic and fantasy images, photos, drawings, paintings, and creative and standard images. In the final stage of selection, we took into account the presence of the memes in the feeds of the students who had compiled the basic array. Using these criteria, a total of 10 memes (5 Russian and 5 Chinese) were selected; each of them was given a sequential number and a conventional name.

A special procedure was developed for the perception test that was used each of the 10 memes with 11 opposite binary characteristics: interesting — boring; current — outdated; useful — useless; clear — incomprehensible; creative — unoriginal, etc. The respondents marked a score of 3 to 1, or 1 to 3, depending on their positive or negative attitude (3 was a high degree; 2 was a medium degree; 1 was a low degree; and 0 was a neutral attitude), in the cells between each characteristic. In addition, the respondents were to suggest a name for each meme, describe the mood and associations brought up by the memes, and rate them on a 5-point scale. In addition, each respondent was to give a brief verbal description to each meme.

In order to test the hypothesis that there are differences between the Russian and Chinese samples in their perception of memes associated with COVID-19 pandemic, the Student's t-test for independent samples was used.

Results

The table below shows the answers to the question of why COVID-19 memes had attracted the respondents' attention (see *Table 1*).

Table 1

Why do COVID-19 memes attract your attention? (% of the number of respondents)

Answer options	Russians n=58	Chinese n=50	Average n=108
This is the most relevant issue	43	72	58
It attracts me because of its humor	31	46	37
It's interesting and made with a flight of imagination	17	54	34
It helps me to deal with self-isolation and compensates for anxiety	28	38	32
It cheers me up	24	22	23
It helps me to relax and have a break	16	30	22
I want to know what people think about it	12	32	21
I collect Internet memes	3	18	10
I find people who feel the same way I do, by seeing how they react to memes	9	10	9
It helps me to connect with and talk to other people on the Internet	14	0	7

The following table shows the breakdown of answers to the question that al-lowed us to identify the semantic aspects of meme perception (see *Table 2*).

Table 2

What are the topics of COVID-19 memes you are most interested in? (% of the number of respondents)

Answer options	Russians	Chinese	Average
Working from home and self-isolation	71	56	64
Government officials and the pandemic	40	30	35
Wear a mask and gloves	24	38	31
Combating the virus	28	44	27
Prevention	5	48	25
Borders closed	16	26	20
Virus origin	5	36	19
Doctors as heroes	7	17	19
Supply shortage	19	14	17

The questionnaire also contained an open question on what attracted the students to memes related to the COVID-19 pandemic. Here, the pivotal motives were relevance, creativity, and humor to help people to get through the pandemic. Below are a few quotes that will help the reader better understand the reasons why the respondents chose this form of content:

"I like it when people are capable of analyzing what is happening in the world and joking about it."
"Memes allow us to maintain contact with the outside world and keep track of all global developments."
"Relevance, cheerfulness, and humor distract from the constant thought: "When will it end?""
"It allows us to survive self-isolation more easily and not to despair."
"It helps to wrap your mind around this and take it easier."
"Memes are an alternative source of news, a digest of the most important things."
"Memes ease tension and raise spirits."
"For me, it's an escape; I can let off steam".
"It would be very sad to talk about this touchy issue without humor."
"Memes help you level out the negative effect and smile at the situation."

Finally, the most important and interesting part was the results of the test where respondents rated the 10 memes they were offered for evaluation (see *Table 3* and *Table 4*).
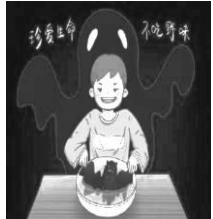
Table 3

Answers to the question: Rate the meme on a five-point scale (Russian memes)

| Memes	Meme description and the most frequent characteristics of meme by respondents	Russians	Chinese	Average
	1. TV show. A photo of a woman who is taking part in *Who Wants to Be a Millionaire?* and trying to choose an answer to the question: "What day of the week is today?"	3	2	2
	Relevant, cheerful, kind, thought-provoking but boring	0	7	9
	2. Cat. A photo of a cat talking to its owner: "Sit down, we need to talk. When are you leaving for work?"	3	3	3
	Cheerful, interesting, attractive, smart, kind, creative but not thought-provoking	4	4	4
	3. Green. A drawing of a person in a green protective suite and a security guard demanding: "Show me your QR code!"	3	3	3
	Relevant, creative, interesting, meaningful but grim	2	0	1
	4. Boys. A painting of a group of boys painting out the number on the house wall. The caption reads: "Muscovites are changing the number of the house to be allowed to go out for a walk."	3	3	3
	Relevant, appropriate, meaningful, smart, cheerful, thought-provoking, kind	7	6	7
	5. Hedgehog. A drawing of a hedgehog holding a "small bag of buckwheat", with gloomy horsemen approaching from the fog: Coronavirus, Economic Collapse, Healthcare Collapse	3	3	3
	Relevant, creative, smart, meaningful, thought-provoking, appropriate but depressing	3	5	4

Table 4

Answers to the question: Rate the meme on a five-point scale (Chinese memes)

Memes	Meme description and the most frequent characteristics of meme by respondents	Russian	Chinese	Average
	6. Girls. A photo showing two little girls. The caption reads: "I want to go to Wuhan!" — "No, you don't!"	2	2	2
	Neutral attitude. Some of the accents: relevant and kind, but straightforward, outdated, not thought-provoking, annoying	3	9	6
	7. Doggy. A drawing of a doggy (in anime style) in bed. The caption reads: "I am staying at home! I am not panicking! This is what I do for my country!"	3	3	3
	Relevant, kind, appropriate, attractive, cheerful but straightforward	2	3	3
	8. Lunch. A drawing of a boy, with a huge bowl with a bat in front. The caption reads: "Take care! Don't eat it!"	2	2	2
	Appropriate, thought-provoking but depressing, grim, straightforward, annoying	2	9	6
	9. Sunset. A drawing of a doctor (in fantasy style) wheeling a bed with a patient in it. The caption reads: "Stop and watch the sunset!"	2	3	3
	Makes less sense for the Russians than other memes but relevant although depressing	5	8	2
	10. Piggy. A photo of a piggy hanging out of the window. The caption reads: "When will I be allowed to go out for a walk?"	3	3	3
	Relevant, cheerful, interesting, attractive, kind	2	4	3

In order to test the hypothesis that there are differences between the Russian and Chinese samples in the perception of memes associated with COVID-19 pandemic, the Student's t-test for independent samples was used.

First of all, we attempted to find out whether there were universal differences between the two groups, unspecific to the particular memes. On average, the Russians gave lower scores across all scales apart from clearness (see *Figure 1*), although only "clearness," "importance," and "thoughtfulness" showed significant differences after the Holm-Bonferroni correction (Sture, 1979) was applied to reduce the family-wise error rate. Comparative statistics and p-values are presented in *Table 5*.
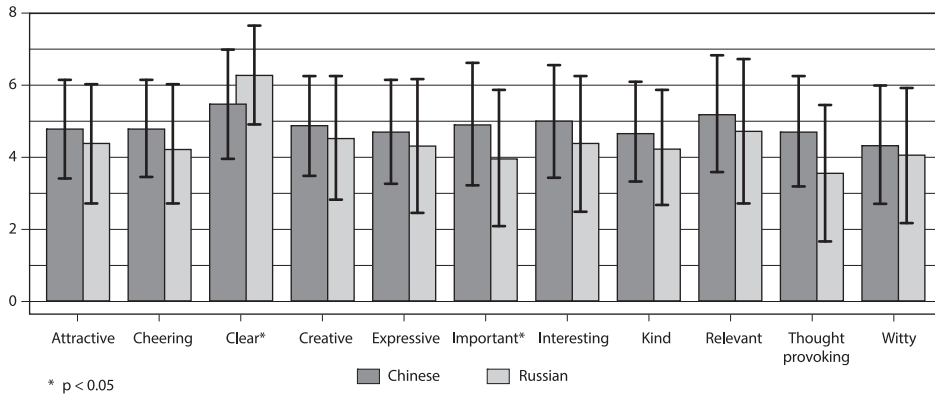
Figure 1. General meme assessment by nationality.

Table 5

Comparison statistics and p-values (Universal differences)

	T	p-value	Df	Adj. p-value*
Attractive	1.32	0.186	1077.3	0.186
Cheering	1.67	0.096	1070.5	0.096
Clear	2.69	0.007	1026	0.043*
Creative	1.16	0.246	1075.1	0.246
Expressive	1.21	0.227	1066.6	0.227
Important	2.7	0.007	1076.7	0.049*
Interesting	1.87	0.062	1076.3	0.062
Kind	1.55	0.121	1077.5	0.121
Relevant	1.33	0.184	1072.8	0.184
Thought provoking	3.39	< 0.001	1072.8	0.006**
Witty	0.91	0.365	1077.8	0.365

*Note. * using Holm-Bonferroni correction; *p < 0.05, **p < 0.01*

Table 6

Comparison statistics and p-values (Specific differences)

		TV show	Cat	Green	Boys	Hedge hog	Girls	Dog	Lunch	Sunset	Piglets
Attractive	$T_{(107)}$	1.09	0.10	0.75	0.41	0.64	1.30	0.41	1.11	1.18	1.43
	p-value	0.277	0.920	0.456	0.684	0.521	0.197	0.680	0.271	0.241	0.155
Cheering	$T_{(107)}$	0.10	0.18	1.33	0.26	0.28	0.44	0.57	0.51	4.13***	1.09
	p-value	0.918	0.856	0.187	0.792	0.782	0.658	0.572	0.613	< 0.001	0.278
Clear	$T_{(107)}$	3.37**	1.92	2.47*	1.58	1.78	0.27	1.41	0.15	0.06	0.11
	p-value	0.001	0.058	0.015	0.116	0.078	0.785	0.160	0.884	0.949	0.914
Creative	$T_{(107)}$	1.87	1.33	1.68	0.43	0.26	1.71	0.03	0.15	1.08	1.55
	p-value	0.064	0.186	0.096	0.665	0.796	0.091	0.975	0.879	0.281	0.124
Expressive	$T_{(107)}$	2.14*	1.33	1.08	0.29	0.06	1.16	0.07	0.54	1.79	1.42
	p-value	0.034	0.186	0.284	0.769	0.953	0.248	0.948	0.593	0.077	0.158
Important	$T_{(107)}$	1.12	1.39	0.81	0.44	1.37	2.31*	1.58	0.70	2.40*	1.61
	p-value	0.264	0.168	0.420	0.662	0.175	0.023	0.118	0.483	0.018	0.110
Interesting	$T_{(107)}$	0.87	0.36	1.22	0.53	0.16	2.19*	0.72	1.10	2.84**	1.76
	p-value	0.389	0.721	0.226	0.599	0.877	0.031	0.472	0.275	0.005	0.081
Kind	$T_{(107)}$	0.21	0.39	2.87**	0.79	1.22	0.28	1.17	2.19*	2.20*	0.33
	p-value	0.836	0.700	0.005	0.432	0.227	0.783	0.243	0.031	0.030	0.740
Relevant	$T_{(107)}$	0.09	0.71	0.46	0.03	1.57	2.15*	1.01	0.56	0.30	0.65
	p-value	0.930	0.482	0.649	0.980	0.120	0.034	0.312	0.578	0.766	0.519
Thought provoking	$T_{(107)}$	1.63	2.04*	0.43	1.53	1.66	2.24*	1.12	2.14*	2.17*	1.73
	p-value	0.106	0.044	0.666	0.128	0.101	0.027	0.266	0.035	0.033	0.087
Witty	$T_{(107)}$	0.78	0.37	0.01	1.02	0.29	1.34	0.63	0.07	1.82	1.10
	p-value	0.435	0.709	0.993	0.311	0.775	0.182	0.530	0.943	0.072	0.274

*Note. *p < 0.05, **p < 0.01, ***p < 0.001*

After that, we investigated which memes contributed the most to the mentioned difference. "Boys," "Hedgehog," "Dog," "Lunch," and "Piglets" memes showed no significant differences between Russian and Chinese assessments at p-value ≤ 0.05, while the most divisive ones turned out to be "Sunset" and "Girls." For comparison statistics and p-values (see *Table 6*) and for descriptive statistics (see *Table 7*).

"TV-show" was rated as the clearest one, but less expressive by the Russian respondents compared to the Chinese ones (see *Figure 2*). The "Cat" meme was rated more thought-provoking by the Chinese respondents (see *Figure 3*). "Green" was deemed easier to understand by the Russians, but kinder by the Chinese (see *Figure 4*). "Girls" seemed more important, interesting, relevant, and thought-

Table 7
Descriptive statistics

	Stat	Intrst	Relnt	Imprt	Clear	Cheer	Thgt pr	Crtv	Attr	Witty	Expr	Kind
Girls												
chn	M	4.94	4.76	4.51	6.24	4.27	4.49	4.80	4.49	4.00	4.63	4.41
	SD	1,61	2.03	1.73	1.07	1.56	1.49	1.33	1.49	1.74	1.36	1.32
rus	M	3.46	3.16	2.93	6.08	3.98	2.98	3.70	3.62	3.09	3.88	4.23
	SD	1.76	2.04	1.71	1.71	1.52	1.81	1.71	1.87	1.66	1.78	1.68
Hedgehog												
chn	M	5.04	6.06	5.24	5.51	3.98	5.39	5.20	5.04	4.69	5.06	4.37
	SD	1.48	1.29	1.63	1.63	1.80	1.74	1.44	1.53	1.63	1.47	1.47
rus	M	4.94	5.03	4.32	6.60	3.78	4.23	5.37	4.61	4.89	5.10	3.56
	SD	1.96	2.02	1.78	1.12	2.14	1.92	1.61	1.86	1.80	1.88	1.84
Sunset												
chn	M	5.78	5.57	5.86	4.20	5.78	5.33	5.16	4.20	5.06	5.24	4.98
	SD	1.56	1.56	1.74	1.91	1.40	1.30	1.48	1.74	1.34	1.53	1.54
rus	M	3.87	5.38	4.11	4.25	3.04	3.84	4.47	3.43	3.90	4.04	3.49
	SD	1.73	1.46	2.17	2.43	1.88	2.18	1.57	1.41	1.79	1.65	1.85
Green												
chn	M	5.43	4.96	5.02	4.49	4.90	5.06	4.71	4.39	4.86	4.63	4.80
	SD	1.38	1.42	1.93	1.22	1.37	1.07	1.09	1.36	1.16	1.19	1.60
rus	M	4.61	5.27	4.43	6.05	4.03	4.79	5.75	4.87	4.86	5.32	2.92
	SD	2.06	2.04	2.00	1.79	1.80	1.96	1.72	1.78	1.80	1.84	1.56
Cat												
chn	M	5.16	5.57	4.61	5.96	5.24	4.43	5.04	5.12	4.47	4.90	5.04
	SD	1.61	1.51	1.62	1.51	1.23	1.58	1.41	1.22	1.73	1.33	1.21
rus	M	4.92	5.10	3.67	6.96	5.36	3.12	4.12	5.06	4.20	4.00	5.28
	SD	1.82	1.86	1.75	0.46	1.54	1.67	2.08	1.75	2.02	2.03	1.67

Table 7 (*continuation*)

		Stat	Intrst	Relnt	Imprt	Clear	Cheer	Thgt pr	Crtv	Attr	Witty	Expr	Kind
Boys	chn	M	5.53	5.92	5.12	5.71	4.96	5.18	5.65	5.33	5.02	5.45	4.80
		SD	1.13	1.08	1.45	1.50	1.31	1.28	1.08	1.19	1.73	1.29	1.17
	rus	M	5.19	5.90	4.83	6.67	5.13	4.16	5.90	5.08	5.72	5.63	5.28
		SD	1.78	1.60	1.79	1.16	1.74	1.98	1.36	1.53	1.69	1.61	1.52
Lunch	chn	M	4.12	4.76	4.98	6.31	3.76	5.16	4.41	4.29	3.31	3.98	4.27
		SD	1.67	2.06	1.97	1.26	1.51	1.79	1.64	1.58	1.92	1.66	1.70
	rus	M	4.86	4.33	4.45	6.40	3.42	3.60	4.31	3.55	3.25	4.35	2.80
		SD	1.93	2.28	2.19	1,54	1.79	1.95	1.74	1.69	1.96	1.76	1.57
Dog	chn	M	4.94	5.35	5.32	6.08	5.12	4.54	4.67	5.10	4.10	4.39	5.10
		SD	1.75	1.66	1.64	1.20	1.31	1.37	1.62	1.22	1.69	1.71	1.18
	rus	M	4.43	4.63	4.19	6.81	4.76	3.79	4.65	5.35	3.66	4.34	5.79
		SD	1.84	2.02	2.14	0.73	1.70	1.97	1.56	1.48	2.04	1.92	1.39
Piglets	chn	M	5.59	5.57	5.18	6.53	5.71	4.24	5.35	5.69	4.63	5.04	5.39
		SD	1.71	1.70	1.62	0.98	1.17	1.94	1.54	1.35	1.87	1.66	1.17
	rus	M	4.35	5.11	4.06	6.59	5.04	3.00	4.29	4.79	3.83	4.03	5.18
		SD	1.98	2.07	1.96	1.40	1.71	1.83	1.92	1.61	2.04	2.07	1.61
Tv-show	chn	M	4.33	4.37	4.06	4.88	4.65	4.02	4.57	4.82	4.20	4.47	4.61
		SD	1.69	1.67	1.75	2,37	1.04	1.61	1.41	0.95	1.41	1.23	1.13
	rus	M	3.72	4.43	3.31	6.98	4.71	2.90	3.32	4.21	3.68	3.05	4.73
		SD	1.98	2.41	1.63	0.44	1.57	1.90	1.90	1.30	1.87	2.07	1.34

provoking to the Chinese respondents (see *Figure 5*). "Lunch" was rated as kinder and more thought-provoking by the Chinese respondents (see *Figure 6*). "Sunset" seemed more cheerful, important, kind, and thought-provoking to the Chinese compared to the Russians (see *Figure 7*).
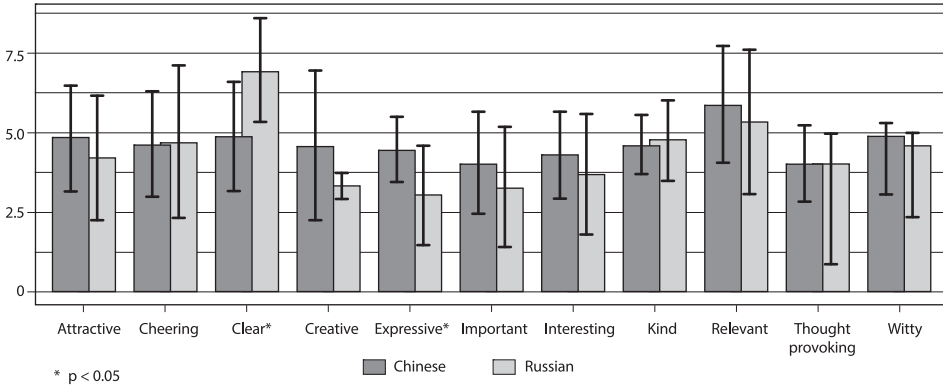

* p < 0.05
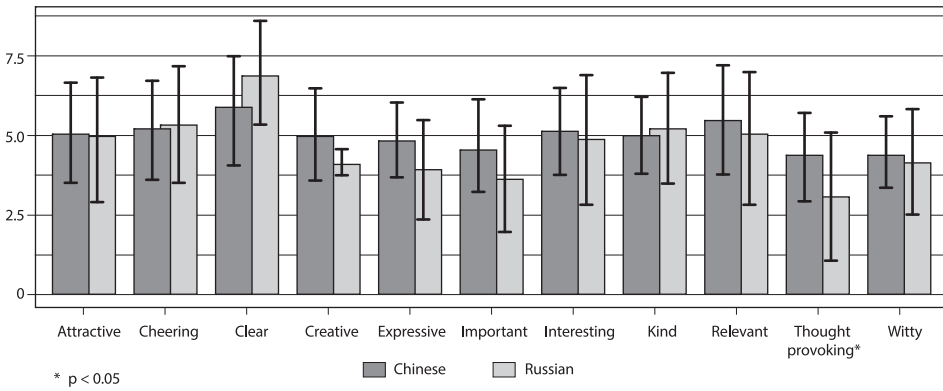
Figure 2. "TV-show" assessment by nationality

* p < 0.05

Figure 3. "Cat" assessment by nationality

* p < 0.05
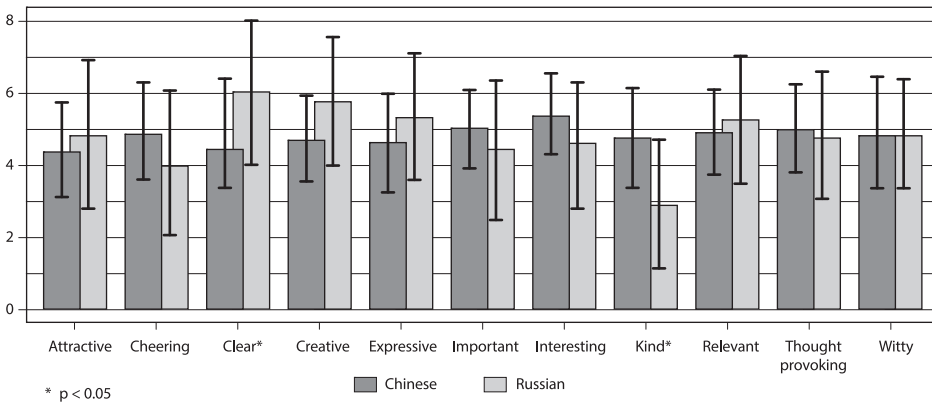
Figure 4. "Green" assessment by nationality
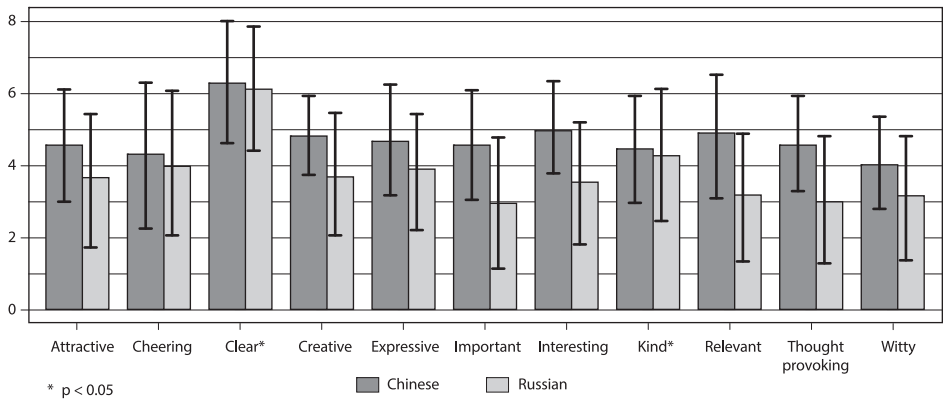
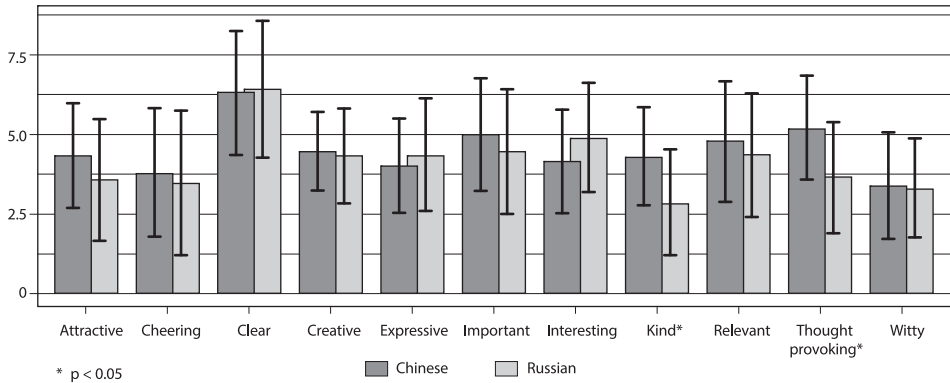*Figure 5.* "Girls" assessment by nationality

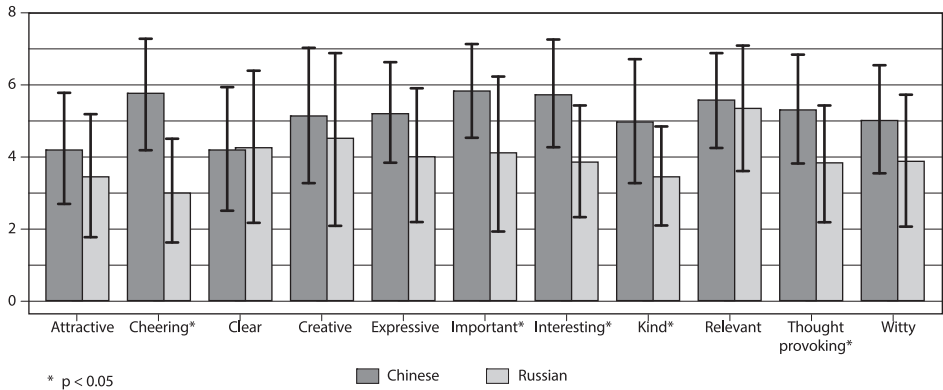*Figure 6.* "Lunch" assessment by nationality

Figure 7. "Sunset" assessment by nationality

Discussion

Our hypothesis was confirmed through both the respondents' answers to the questionnaire and the test. Indeed, COVID-19 memes in such ethnoculturally different audiences as Russians and Chinese serve a compensatory function for young peo-

ple, helping them overcome, through their relevant content and creative form, the hardships of the pandemic. A new communication medium, which offers entirely different information opportunities and relations between the audience and the medium, requires researchers to explore and understand these new realities, which affect, among other things, the functioning and audience perception of the content related to healthy living and, in particular, the issue of the COVID-19 pandemic.

Further research may include a t-test for a broader group of respondents, and the study of perception of memes by respondents with different demographic profiles (gender, age, education, etc.), as well as the dispersion analysis of repeated-measures ANOVAs to examine differences in emotional responses between different memes. Another important line of further research would be the analysis of memes in the context of different language cultures, and the study of the perception of memes in terms of content comprehensibility, the degree of involvement in the situation, and the level of knowledge of the original culture. In addition, the immediate task of this project was to analyze the visual imagery of memes and its semiotic relationship to the text in more detail.

Conclusion

As a whole, the Russian and Chinese respondents shared a common view on basic issues related to the functions, content, and form of Internet memes, as well as the key trends on their impact on people during the COVID-19 pandemic. This fact argues in favor of a "post-national" global picture, even despite the differences in the perception of Internet memes on the same topical subject. Some specific conclusions include the following.

Memes that evoked a positive response from the respondents and cheered them up were scored the highest. Such qualities as relevance, kindness, cheerfulness, creativity, meaningfulness, and thought-provoking ability were rated high. Each group of respondents gave a higher score to "our own" memes and a lower score to the other group's memes. However, it should be noted that it is generally typical of the Chinese respondents to have a more positive perception of reality than the Russians, and to be more tolerant of memes representing another culture. The Russian respondents demonstrated a rather sober and skeptical view of the issues and the ways they are depicted in memes. For many memes, the average score given by Russian and Chinese respondents was quite similar, but on average, the Russian scores were 0.3 points lower than the Chinese ones.

We ascertained a tendency toward polarization of opinions and focus on individualization among the Russian respondents, whereas the Chinese respondents strove for orderliness and consensus; this was particularly evident when analyzing the preferred subjects of the memes related to the COVID-19 pandemic. There was a marked difference in the preferred subjects between the two: the Russians were more concerned about self-isolation while the Chinese put greater emphasis on topics related to prevention, virus origin, combating the virus, people's behavior during the pandemic, and the heroic work of doctors. There was a clear gender polarity in the perception of memes among the Russian respondents. At the same time, male Chinese respondents were notably closer in their scores and the perception of memes to both female Chinese and Russian respondents. Animal memes

got the most positive feedback. It appears that using animals as the image is appealing for both cultures, probably because it is a version or replication of a universal invariant (the animal).

Limitations

This research had some limitations. There were a limited number of respondents, most of them were female students, and the Russian participants were mostly from Moscow. Another limitation was an insufficient breadth of language cultures represented (the comparative analysis included only the Russian and Chinese language cultures). In addition, the issue of the visual imagery of memes and its semiotic relationship to the text has been poorly studied.

Acknowledgments

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Conscious Self-Regulation and Self-organization of Life During the COVID-19 Pandemic

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Background. In a pandemic situation, the search for psychological resources for successful self-organization of life under the changing conditions becomes an urgent issue. Revealing the role of a person's conscious activity to achieve such self-organization during the lockdown period is the goal of this study.

Objective. Our main task was to monitor self-assessments of life self-organization in different age groups. Another was to evaluate the extent to which conscious self-regulation contributes to the success of self-organization, to overcoming its difficulties, and to accepting the uncertainty of the future.

Design. The data were obtained online on the Testograf platform (www.testograf.ru), which was provided by the all-Russian research project "Exploring at home!" (www.issleduemdoma.ru), a study which ran from late April to early June 2020. The sample was comprised of 1634 people, ages 18-60, from 69 regions of Russia. The methods were "Morosanova's Self-regulation Profile Questionnaire — SRPQM 2020" and the authors' *ad hoc* questionnaire "Self-organization of life during a lockdown."

Results. The majority of respondents assessed their level of self-organization as medium (67.6%) and high (17.3%). The general level of self-regulation was associated with successful self-organization in all age groups. Regression analysis revealed that being able to cope with and accept uncertainty depended primarily on flexibility, persistence, planning goals, and modeling conditions. Overcoming the difficulties of self-organization depended on the same indicators, with additional contributions of reliability and programming of actions. Students demonstrated significantly lower levels of self-regulation than older people; as a result, young people experienced more difficulties in organizing their lives under self-isolation conditions.

Conclusion. The higher the level of conscious self-regulation, the more productive a person is when self-organizing his/her behavior in case of a lockdown. The difficulties of self-organization, in turn, are associated with a low level of regulatory resources.

Keywords: coronavirus; COVID-19; conscious self-regulation; self-organization; age

Introduction

The pandemic situation in which the world has found itself in 2020 is unprecedented in its scale and power of influence on all domains of human life (Brooks et al., 2020; Usher, Durkin, & Bhullar, 2020). In these crisis conditions, medical resources are of primary importance for saving lives. At the same time, a heavy demand for psychological resources has emerged, as required for preventing problems, enhancing immunity, and facilitating people's rehabilitation from the disease. The lack of psychological resources is among the main causes of suffering from the deaths of close associates, job loss, restrictions on people's mobility, complications of family relationships linked to isolation, and the uncertainty and fear for the future (Guterres, 2020). In this situation, a person's ability to consciously self-regulate requires additional research. In the broadest sense, self-regulation is an important human capability, one that contributes to success and well-being in a broad variety of spheres (Baumeister & Alquist, 2009).

We consider conscious self-regulation from the standpoint of V. Morosanova. She defines it as the human ability to consciously set goals and manage their achievement by means of functional regulatory-cognitive processes (*i.e.,* goal planning, modeling of significant conditions, programming of actions, and results evaluation), and instrumental regulatory-personal features (*i.e.,* flexibility, independence, and reliability) (Morosanova, 2010). Through applying these regulatory resources, a person coordinates his/her other psychological resources to advance and achieve the goals of his/her activity (Morosanova, 2014).

A person's general ability for self-regulation determines the success of his/her behavior, especially in the case of significant changes in living conditions, the emergence of new tasks, and the need to master unfamiliar or unusual types of activity (Konopkin, 2011; Morosanova & Bondarenko, 2016). The current period of the COVID-19 pandemic represents just such a significant change, and is characterized by a significant increase in the level of uncertainty in all areas of life, including work, leisure, food, and sports (Stankovska, Memedi, & Dimitrovski, 2020; Wang, Di, Ye, & Wei, 2020).

The crisis conditions of the pandemic and the introduction of quarantine restrictions have dramatically changed people's educational and work environment. In all areas of education and professional training, the emphasis has had to shift to remote digital technologies, which drastically change and, in essence, narrow the scope of personal interaction in educational practice. According to researchers, 25% to 28% of students under these conditions show an increased level of worry and anxiety, which in turn reduces their productivity (Cao et al., 2020; Wang et al., 2020). It is quite natural that the burden on conscious self-regulation is increasing. Its resource value for education, professional self-determination, and in general, for work and life in a situation of global risks and large-scale changes of the human existence, is difficult to overestimate.

It can be assumed that conscious self-regulation makes a significant contribution to the self-organization of life under the new conditions of the coronavirus pandemic.

Self-organization was previously often considered with regard to various aspects of educational activity: the formation of skills of rational behavior in the edu-

cational process; organization of independent work for students; formation and improvement of self-learning activities; self-development; and personality self-realization (*e.g.*, Ishkov, 2016; Kostromina, 2010). The concept of "self-organization" is also conceptually related to the phenomena of time structuring (Sobol-Kwapińska et al., 2018), time management (Oettingen, Kappes, Guttenberg, & Gollwitzer, 2015), procrastination (Steel, 2007; Van Eerde & Klingsieck, 2018), and time control (Bond & Feather, 1988).

In our opinion, the success of self-organization during a lockdown period is primarily manifested in making lifestyle changes based on accepting the need for quarantine measures during the pandemic spread. In this regard, we hypothesize that conscious self-regulation can predict success in life self-organization under the changing conditions, and in overcoming the difficulties associated with uncertainty of the future.

This empirical study was carried out during the quarantine period in order to find answers to the following relevant questions:

1. Is there a relationship between a person's conscious self-regulation and his/her self-organization under conditions of imposed isolation?
2. Which components of conscious self-regulation are associated with effective self-organization, overcoming the difficulties of self-isolation, and coping with the uncertainty of the future?
3. Are there any age differences in the components of conscious self-regulation and indicators of a person's self-organizations during a lockdown?

Methods

Participants

The study participants were recruited among the visitors to the website *www.issleduemdoma.ru*. They were invited to fill out the questionnaires in exchange for feedback. The study involved 1634 people (1386 female, 84.8%), ages 18 to 60 (M = 30.17, SD = 11.83). The sample came from 69 subjects (political divisions) of the Russian Federation. Online informed consent was obtained from the participants for processing their personal data strictly for scientific research purposes. Data quality assurance included removing outliers through the boxplot function.

Procedure

The survey was conducted from late April to early June 2020, starting three weeks after the introduction of the quarantine measures and self-isolation regime in the Russian Federation. The study was organized by means of the Russian service for online surveys Testograf (*www.testograf.ru*) as part of the all-Russian scientific project "Explore at home!" (*www.issleduemdoma.ru*).

Questionnaires

1. The 28-item *Morosanova's Self-Regulation Profile Questionnaire (SRPQM),* modified release of 2020, is designed to assess the general ability for conscious self-regulation and its components, which are consistently manifested in various types of

the voluntary activity and life situations (Morosanova & Kondratyuk, 2020*)*. The questionnaire includes seven scales: four of them assess regulatory-cognitive processes (*goal planning; modeling of significant conditions; programming of actions*; and *results evaluation*) and three of them evaluate regulatory-personal features (*flexibility; reliability;* and *insistency*). The questionnaire also contains the cumulative indicator of the seven scales, and make up the general level of self-regulation. Participants responded to each item on a 5-point Likert scale, which ranged from 1 = "strongly disagree" to 5 = "strongly agree," so that the total score for each scale ranged from 4 to 20, and for the cumulative scale, from 28 to 140. Cronbach's alphas for the scales in the present study ranged from 0.60 to 0.83.

The *goal planning* scale characterizes individual differences in setting the goals of activities (*e.g.,* "I plan my future goals down to the details"). The *modeling of significant conditions* scale evaluates a person's understanding of external and internal significant conditions for achieving his/her activity goals ("It is difficult for me to take into account the changing circumstances in time"). The *programming of actions* scale defines individual characteristics of a person's conscious construction of his/her action program ("To carry out the work, I need to plan the sequence of my actions"). The *results evaluation* scale evaluates the adequacy of a subject's assessment of him or herself, his/her actions, and the results of his/her activities and behavior ("At the end of the day, I summarize what has been done").

The *flexibility* scale measures the level of regulatory flexibility as the ability to rebuild, and to adjust the self-regulation system with regard to changing external and internal conditions for activity ("I can easily adapt to new situations"). The *reliability* scale reflects the stability of conscious self-regulation of a person's mental and practical activity in complicated, psychologically stressful situations ("It is usually difficult for me to work when I am upset"). The *insistency* scale allows the diagnosis of perseverance and determination in achieving the goals of activities ("I persist in solving a difficult task"). And the *integrative* scale (general level of self-regulation) shows the overall level of an individual's system of behavior self-regulation or, in other words, the regulatory resources of a person for achieving his goals.

2. For the purposes of the present study, the authors designed an ad hoc questionnaire called "*Self-organization of life during a lockdown*." The questionnaire consists of 16 points and includes three scales: 1) success in life self-organization; 2) difficulties in life self-organization; and 3) difficulties in accepting uncertainty. The general index of self-organization is calculated by summing up the scores from all three scales. It's worth noting that when calculating the general index of self-organization, the items included in the scales "difficulties in life self-organization" and "difficulties in accepting uncertainty" are considered as inverse.

Participants were invited to answer a series of questions concerning their self-organization during the lockdown period, using a 5-point Likert scale from 1 ("strongly disagree") to 5 ("strongly agree"). The total score for scale 1 (success in life self-organization) ranged from 8 to 40; for scale 2 (difficulties in life self-organization) and 3 (difficulties in accepting uncertainty), from 4 to 20, and for the "general index of self-organization," from 16 to 80.

The scale "success in life self-organization" reveals how successfully adults cope with the need to work, study, and communicate remotely under conditions of self-

isolation, and whether they manage to adapt and organize their lives under the new circumstances: *i.e.,* to observe a daily routine, maintain working hours and rest. The scale "difficulties in life self-organization" reflects the emerging concerns and difficulties around the new way of life, including its organization, compliance with lockdown rules, remote work, study, and communication. The scale "difficulties in accepting uncertainty" is related to the acceptability and attitude toward the situation of uncertainty arising from the coronavirus pandemic spreading in the world. The "general index of self-organization" characterizes the overall personal effectiveness of life self-organization under the conditions of a lockdown and global pandemic.

In order to confirm the relevance of the questionnaire structure, we conducted an exploratory factor analysis (analysis of the main components by Varimax rotation method with Kaiser Normalization). From the 16 statements, we have extracted three factors corresponding to the three scales of the questionnaire. Together, the three factors, with a total of 16 items, explained 56.92% of the variance. The first factor, with an eigenvalue of 2.57, explained 28.60% of variance. The second factor, with an eigenvalue of 1.53, explained 16.97% of the variance. And the third factor, with an eigenvalue of 1.02, explained 11.35% of the variance. The three factors underlying the three scales were well-defined, having mostly large loadings. The scales' internal consistency ranged from 0.67 to 0.81.

Data Analysis

Data analysis was performed using the Statistical Package for Social Sciences (SPSS) (version 26). Pearson's correlation analyses were conducted to explore the correlations between conscious self-regulation and variables of life self-organization. A one-way ANOVA was used to indicate significant differences in the self-regulation and self-organization variables among the age groups.

The sample was split into three age groups. The first group consisted of subjects ages 18–25 years (827 people, 84% female). Most of them were the students involved in remote educational activities during the lockdown period. The second group included respondents ages 26–40 years (433 people, 84% female). The third group consisted of subjects ages 41–60 years (374 people, 86% female). A linear regression analysis was conducted to investigate how conscious self-regulation related to people's self-organization during a lockdown.

Results

Table 1 shows the means, standard deviations, and min and max values for self-regulation and self-organization components in our sample. Based on descriptive statistics, we analyzed the percentage of respondents with low, medium, and high levels of the general index of life self-organization during lockdown. The study results show that 15.1% of respondents (N = 246) experienced difficulties in accepting the need to comply with lockdown rules, and in organizing a new mode of life based on remote work/study and communication. Sixty-seven, six tenths percent (67.6%) of respondents (N = 1104) had an average level of efficiency in their life self-organization during the lockdown. High individual effectiveness in organizing one's life in this situation was observed in 17.3% (N = 284).

Table 1

Descriptive Statistics (N = 1634)

Variables	Min	Max	Mean	SD
Goal planning	4	20	12.30	3.46
Programming of actions	4	20	14.69	2.80
Modeling of significant conditions	4	20	12.59	2.78
Results evaluation	4	20	12.35	3.58
Flexibility	4	20	12.92	3.16
Reliability	4	20	10.18	3.31
Insistency	4	20	14.18	3.00
General level of self-regulation	43	136	89.24	13.34
Success in life self-organization	8	40	24.92	6.69
Difficulties in life self-organization	4	20	11.88	3,66
Difficulties in accepting uncertainty	4	20	12.22	3.62
General index of self-organization	16	80	48.81	10.93

A correlation analysis was carried out to identify significant relationships between self-regulation components and the special demands of life self-organization during lockdown (see *Table 2*).

Table 2

Results of the correlation analysis between variables of self-regulation and self-organization

Self-regulation	Self-organization			
	Success in life self-organization	Difficulties in life self-organization	Difficulties in accepting uncertainty	General index of self-organization
Goal planning	0.21**	–0.13**	–0.20**	0.24**
Programming of actions	0.17**	–0.06*	–0.01	0.12**
Modeling of significant conditions	0.24**	–0.23**	–0.26**	0.31**
Results evaluation	0.20**	–0.07**	–0.11**	0.18**
Flexibility	0.39**	–0.20**	–0.29**	0.39**
Reliability	0.14**	–0.22**	–0.28**	0.25*
Insistency	0.33**	–0.09**	–0.08**	0.26**
General level of self-regulation	0.40**	–0.24**	–0.29**	0.42**

*Note. * p<0.05; ** p<0.01.*

The results indicated a large number of statistically significant correlations. Positive relationships were recorded between the regulatory components, scale of success in life self-organization and the general index of self-organization. That is, the higher the level of self-regulation, the easier a person could change his/her lifestyle and organize his/her behavior (activity) during a lockdown period. Negative correlations were obtained with respect to the scales reflecting the difficulties of self-organization and acceptance of uncertainty. This result indicates that people with a reduced level of conscious self-regulation are more likely to experience various difficulties in self-organization under the changed conditions. It is more difficult for them to observe the lockdown rules, maintain optimal productivity levels in educational and professional activities, and adapt to the situation of uncertainty.

A regression analysis made it possible to examine the specifics of regulatory predictors of people's self-organization during a lockdown. Four regression models were analyzed for all manifestations of self-organization, including the general index. Seven self-regulation components served as the independent variables. The dependent variables were indicators of self-organization. The tolerance and VIF (Variance Inflation Factor) were acceptable for all variables (1.18-1.50); therefore the regression models are acceptable for further interpretation. *Table 3* shows the final regression models that include only significant predictors (see *Table 3*).

Table 3

Results of the regression analysis

Criterion	Adjusted R^2	F/df	Significant predictor	Beta	p
Success in life self-organization	0.21	63.81(7), 1626	Flexibility	0.30	0.00
			Insistency	0.15	0.00
			Results evaluation	0.07	0.00
			Programming	0.07	0.00
			Reliability	0.05	0.04
Difficulties in life self-organization	0.09	25.29(7), 1626	Flexibility	−0.15	0.00
			Reliability	−0.16	0.00
			Modeling	−0.13	0.00
			Insistency	0.06	0.04
Difficulties in accepting uncertainty	0.16	45.92(7), 1626	Flexibility	−0.21	0.00
			Reliability	−0.20	0.00
			Goal planning	−0.13	0.00
			Modeling	−0.12	0.00
			Insistency	0.10	0.00
General index of self-organization	0.23	71.48(7), 1626	Flexibility	0.31	0.00
			Reliability	−0.15	0.00
			Modeling	0.11	0.00
			Goal planning	0.07	0.01

It should be noted that composition of the regulatory predictors differed for various indicators of self-organization. At the same time, regulatory *flexibility* turned out to be significant for all indicators of self-organization. This regulatory-personal characteristic was associated with the ability to quickly restructure one's behavior and activities under changing external and internal conditions, which, of course, is essential during a lockdown period. A reduced level of this ability, apparently, leads to difficulties in self-organization and performance in situations of uncertainty.

The regulatory-personal characteristic of *reliability* also acted as a significant predictor of the ability to self-organize. This feature characterizes the stability of the self-regulation system in psychologically stressful situations. A high level of *reliability* indicates that a person is able to effectively organize his activities, while maintaining its optimal results, despite obvious situational difficulties.

Interesting results were identified for the regulatory-personal characteristic of *insistency*, which reflects persistence in achieving goals. This is the only regulatory component positively associated with difficulties in self-organization and accepting uncertainty. Apparently, for persistent and determined people, the lockdown situation turned out to be a serious obstacle for achieving their goals. Limited opportunities and a sense of impotence led to aggravation of the perception of uncertainty and awareness of the complexity of the situation.

The regulatory-cognitive components also proved to be significant predictors of self-organization. *Conscious programming of actions* and *evaluation of their results* were significant predictors of success in life self-organization during the lockdown time. Apparently, reflection on their actions and their results in the new conditions allowed people to quickly adapt and adjust their behavior, redistributing their capabilities. *Programming of actions* under conditions of a lockdown is also a valuable resource, since the lack of clear time limits in the remote mode of learning and working activities can cause the illusion of expandable deadlines. People with a high level of programming their actions more successfully organized themselves to effectively perform their duties on schedule in a lockdown situation.

Yet another significant predictor for the general index of self-organization was the *goal planning* process. This process has significance in building an entire system of conscious self-regulation of activity, which, as a whole, contributes to the effective organization of a person's new lifestyle.

Our study revealed that the difficulties of self-organization were associated with the insufficiently developed capabilities for *modeling* and *programming* processes. Difficulties in accepting uncertainty were higher in people with the reduced cognitive-regulatory processes of *modeling* and *planning*.

Thus, the regression analysis made it possible to identify the specific regulatory resources that are significant for self-organization of life during a lockdown period. The foremost resources were the regulatory-personal features of *flexibility* and *reliability*. High levels of the cognitive-regulatory processes of *planning, modeling, programming*, and *results evaluation* also contributed to productive self-organization.

At the next stage of the data analysis, we identified the age-related differences in the manifestations of self-regulation and self-organization. Analysis of the frequency of occurrence of high, low, and medium levels of self-organization efficiency (according to the general index of life self-organization) within different age

groups revealed that among the young people (the first group), the percentage of respondents with a low general index of self-organization was higher (18%) than in the two other groups (12% in each group). *Table 4* shows the results of the variance analysis by ANOVA.

Table 4

Means and standard deviations in different age groups for variables of self-regulation and self-organization and comparisons for observed means

| Variables | Age groups | | | | | | F/df | Sign. diff. between groups |
| | Group 1 18–25 (N=827) | | Group 2 26–40 (N=433) | | Group 3 41–60 (N=374) | | | |
	M	SD	M	SD	M	SD		
Goal planning	11.98	3.43	12.77	3.53	12.47	3.38	7.95(2)	0.00
Programming	14.29	2.92	15.08	2.75	15.15	2.45	18.16(2)	0.00
Modeling	12.45	2.73	12.81	2.85	12.68	2.83	2.59(2)	0.07
Results evaluation	12.24	3.54	12.41	3.62	12.56	3.63	1.09(2)	0.33
Flexibility	12.94	3.21	13.38	3.00	12.37	3.17	10.29(2)	0.00
Reliability	9.57	3.30	10.83	3.31	10.81	3.11	30.01(2)	0.00
Insistency	13.87	3.16	14.60	2.88	14.38	2.71	9.47(2)	0.00
General level of self-regulation	87.34	12.82	91.88	13.60	90.42	13.58	18.64(2)	0.00
Success in life self-organization	24.46	6.98	25.19	6.40	25.64	6.34	4.46(2)	0.01
Difficulties in life self-organization	12.34	3.70	11.28	3.60	11.59	3.52	13.79(2)	0.00
Difficulties in accepting uncertainty	12.37	3.69	12.00	3.63	12.19	3.44	1.50(2)	0.22
General index of self-organization	47.76	11.12	49.91	10.77	49.87	10.52	7.85(2)	0.00

The pairwise comparisons were used to indicate differences between the three groups (Bonferroni post hoc testing). The results demonstrated that indices of conscious self-regulation and the general index of self-organization under self-isolation conditions were significantly lower in the first age group. Significant differences were obtained between this group and groups 2 and 3 for the variables of *programming, reliability, insistency, general level of self-regulation*, and all the indicators of self-organization. The results demonstrated that resources of conscious self-regulation and the general index of self-organization in a lockdown time are significantly lower in the first age group. Young people experience difficulties in their life self-organization, apparently due to the fact that productive patterns of conscious self-regulation only start to actively form in this age period under the influence of the requirements of educational and professional activities.

The results in the second and third groups are generally similar. Significant differences between them were revealed only in terms of regulatory *flexibility*. It might be assumed that older people would find it more difficult to rebuild, abandon their usual lifestyle, and adapt to the new conditions, but these difficulties were compensated for by a higher general level of the conscious self-regulation.

Next, we analyzed the specifics of significant regulatory predictors of the general index of self-organization in the three selected age groups. Regression analysis showed some differences, both in the composition of predictors and in the percentage of variance explained. In the first group, significant predictors were *planning* ($\beta = 0.08$, $p < .05$), *modeling* ($\beta = 0.10$, $p < .01$), *flexibility* ($\beta = 0.39$, $p < .001$), and *reliability* ($\beta = 0.15$, $p < .001$). In the second group, they were *modeling* ($\beta = 0.16$, $p < .01$), *flexibility* ($\beta = 0.23$, $p < .001$), and *reliability* ($\beta = 0.14$, $p < .01$). In the third group they were *flexibility* ($\beta = 0.27$, $p < .001$), *reliability* ($\beta = 0.14$, $p < .01$), and *insistency* ($\beta = 0.13$, $p < .05$). The percentage of explained variance R^2 is greatest for the first group — 0.27.

These results indicate the importance of self-regulation for for youth being able to self-organize their lives. For older people, who, as a rule, have had some professional experience, self-organization is provided to a certain extent by the automated regulatory skills. Our results emphasize the importance of development and self-development of conscious self-regulation for effective self-organization under lockdown conditions.

Discussion

The pandemic situation has led to significant changes in the mode of implementing professional and educational activities. People's perception of discrepancies and the inadequacy of the new requirements triggers the processes of conscious self-regulation of human activities (Kooij, 2020). For most people, remote work and education have turned out to be a new form of life. It has previously been shown that long-term remote work in online environment can significantly reduce employees' self-esteem and self-confidence due to an emerging sense of professional and social isolation (Golden, Veiga, & Dino, 2008). At the same time, the present study showed that a significant percentage of Russian respondents (85%) assessed their self-organization as successful, which, however, does not exclude having difficulties.

Among the main problems with remote work/education, as indicated by Jaiswal and Arun, are, first of all, violations of schedule, then an increase/decrease of work time, and thus the inability to find a balance between work (or school) and family (personal) affairs. All this inevitably affects the level of productivity (Jaiswal & Arun, 2020).

In the model developed in this study, in addition to the indicator of "difficulties of self-organization," we also included indicators of "difficulties of accepting uncertainty" and "success of self-organization," which made our analysis more specific and comprehensive.

The study results allowed us to uncover the significant contribution of the capability for conscious self-regulation in people's life self-organization under condi-

tions of imposed self-isolation. Our data are consistent with the previous studies which demonstrated that people with a high general level of conscious self-regulation are most successful in atypical and new situations (Konopkin, 2004; Morosanova, 2014). It is worth pointing out that high self-regulation is more pronounced when performing atypical and new tasks (Morosanova & Bondarenko, 2016) and serves as a significant resource for overcoming difficult life situations (Aspinwall & Taylor, 1997) and acute stress (Morosanova, Kondratyuk, Gaidamashko, & Voytikova, 2018).

Previously, in a sample of people in high-risk professions, we have shown that regulatory *flexibility, modeling*, and *reliability* serve as special predictors of the ability to cope with stress in emergencies (Morosanova, Kondratyuk, & Gaidamashko, 2020; Morosanova et al, 2018). The present study results are consistent with those results: *flexibility* and *reliability*, as well as *modeling* and *goal planning*, turned out to be the foremost predictors of the general self-organization index in the situation of imposed isolation. These findings also contribute to Smith and her colleagues' conclusion that inflexibility and intolerance of uncertainty, combined with high levels of social isolation, lead to increasing depression and, in particular, anxiety (Smith, Gavey, Riddell, Kontari, & Victor, 2020).

Psychological flexibility and the ability to stay in the present moment and participate in the value-oriented activities, even in the presence of negative emotions in a pandemic situation, turned out to be a positive factor. It has been shown that components such as behavioral awareness and openness to new experiences were associated with lower levels of distress (Kroska, Roche, Adamowicz, & Stegall, 2020). A study conducted on a British sample during the lockdown in May 2020 demonstrated that psychological flexibility explained 5 to 18% of the variance of distress (including that specific to COVID-19) and psychological well-being (Dawson & Golijani-Moghaddam, 2020).

Regulatory-cognitive processes of *planning goals*, *modeling* significant conditions, *programming actions*, and *evaluating results* also made a positive contribution to self-organization and, as a result, success in task performance. In turn, the difficulties of self-organization were associated with the low level of these regulatory processes, which becomes especially obvious under conditions of imposed self-isolation. New interesting results were obtained concerning the contribution of the regulatory-personal feature of *insistency* to the success of self-organization. Due to their ambiguity, these results require further research.

Analysis of the age specifics of self-organization and self-regulation carried out on the large sample of the Russian respondents from various territories made it possible to establish that young people (mostly students) experienced more difficulties in organizing their learning activities in remote mode, compared with older participants. Young people were also characterized by lower levels of conscious self-regulation.

In a recent study, Inan, Yukselturk, Kurucay, and Flores (2017) emphasized that self-regulation processes, and primarily planning, are important factors explaining success and subjective satisfaction of students in the process of online learning. Dabbagh and Kitsantas also noted that self-regulation is becoming a critical factor

for success in digital learning, as students must rely more on their self-regulation resources for learning activities (Dabbagh & Kitsantas, 2004). Our data confirmed and developed these ideas.

As for older people, our results demonstrated that their more developed system of conscious self-regulation (compared to the young participants), allowed them to organize their activities more productively, despite the fact that, as a rule, these people have to not only regulate their professional activities, but also cope with household and family affairs.

Our findings support previous studies showing that older workers are better at regulating emotions (Scheibe, Spieler, & Kuba, 2016). This, in turn, is necessary for effective adaptation and response to career challenges under pandemic conditions (Restubog, Ocampo, & Wang, 2020). Therefore, in some countries, researchers record a negative relationship between age and stress in self-isolation situations (Losada-Baltar et al., 2020). In addition, it has been shown that older people use various self-regulation strategies aimed at constantly maintaining the necessary level of compliance with the requirements of their environment (Kooij, 2020).

Conclusion

In a pandemic, conscious self-regulation is of particular importance for overcoming uncertainty in all spheres of human activity and for people's successful life self-organization. From our point of view, self-organization under conditions of self-isolation is characterized by a rational change in lifestyle due to the need to comply with the rules of quarantine measures.

This study demonstrated that the higher the conscious self-regulation level, the more productive a person is in self-organization of his/her behavior in a lockdown period. Analysis of the results identified specific regulatory peculiarities that help coping with the difficulties of self-organization; foremost were regulatory *reliability* and *flexibility*. The study results as a whole can become the basis for developing practical recommendations for self-organization of educational and professional activities during a pandemic.

Limitations

The study participants represented various territories of the Russian Federation which implemented different restrictive modes during the COVID-19 pandemic, based on local morbidity levels. We plan in the future to consider the contribution of the residence region factor in the identified patterns. For future research, it also seems relevant to consider the personality determinants in the self-regulation and self-organization of people who have to work and study distantly in the lockdown conditions. These features may explain the existence of patterns of increased vs. reduced productivity in remote mode among different people.

We found no gender differences in self-regulation and self-organization. Note that this result is not unexpected, given that the universal structure of conscious self-regulation does not imply any gender-based differences, since its development is determined primarily by personality characteristics. It is likely that this conclu-

sion is also true in relation to the self-organization phenomenon, but this aspect has yet to be investigated.

It seems promising that we have already begun research into the role of self-regulation resources and actual self-organization in the prevention of negative stressful conditions during a pandemic. The pandemic situation increases stress and leads to negative emotional reactions, which, in turn, reduce immunity and lead to an increase in morbidity (Bulgakova, 2011; Vetlugina et al., 2012). Thus it would seem that conscious self-regulation can serve as a psychological resource for stabilizing and enhancing immunity, since a high level of self-regulation, according to our data, impedes the development of acute stress reactions and negative emotional states in emergency situations (Morosanova, 2010; Morosanova et al., 2018). Verification of this assumption requires organization of special interdisciplinary research in the future.

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China's Mental Health Interventions During the COVID-19 Outbreak

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Background. The COVID-19 outbreak has threatened both the physical health of individuals who contracted the virus, and the mental health of everyone directly or indirectly associated with or concerned about it.

Objective. As telecommunication technologies and online mental health apps become more available and affordable, they allow behavioral and mental health professionals to provide quality care by handling problems arising from the COVID-19 outbreak virtually. The aim of the current article is to summarize the online psychological assistance supported by the Chinese government during the epidemic.

Design. Several measures, policies, action plans, and programs that have been underway in China during the COVID-19 outbreak epidemic are listed to provide guidance for mental health intervention practices around the world.

Results. A total of seven types of mental health services and supports developed in China were listed and introduced: 1) online psychological assistance; 2) online psychological self-assessment and self-help; 3) a "Peace of Mind" self-help counseling camp; 4) a "Peace of Mind" self-help training camp; 5) mental health training and lectures; 6) psychological assistance to Hubei; and 7) collaboration with social workers in "Thousands of Institutions Send Peace of Mind." Moreover, several areas for the organization and management of psychological intervention activities in the future were identified.

Conclusion. Mental health interventions helped people cope with their mental health concerns during the outbreak of COVID-19. They could facilitate the development of Chinese public emergency interventions, and eventually improve the quality and effectiveness of emergency interventions in China.

Keywords:
COVID-19;
China; mental
health;
emergency
interventions;
psychological
assistance

Introduction

The COVID-19 outbreak, first reported in China in late 2019, has shown up all around the world in 2020. Based on reports from China, where the outbreak was initially reported, the epidemic not only threatens the physical health of those who contract the virus, but also seriously affects the mental health of everyone directly or indirectly associated with or concerned about it.

In China, the national standards on mental health services, especially psychological counseling and crisis intervention, were established after the Wenchuan earthquake in 2008 (Zhang et al., 2012). The emergency medical rescue efforts after the earthquake, and lessons learned from them, quickly became important mechanisms guiding the public health field in addressing psychological issues in the population (Duan, & Zhu, 2020).

Encouraged by the emphasis placed by the president of China on strengthening psychological intervention and humanistic care, and guided by the measures and emergency policies taken by the Chinese government for psychological assistance, the Chinese Psychological Society (CPS), together with professional psychological workers, started working diligently to improve the mental health of the general public and the health practitioners during the COVID-19 epidemic. A list of the measures, policies, action plans, and programs that have been implemented in China since the pandemic are reported here, in hopes of providing guidance on mental health intervention practices around the world.

Measures and Emergency Policies Taken by the Chinese Government for Psychological Assistance During the Epidemic

On February 3, 2020 the president of the People's Republic of China, Xi Jinping, emphasized the need to strengthen psychological intervention and humanistic care. On February 23, Xi delivered an important speech at the Conference on the Overall Promotion of Economic and Social Development and Deployment of Prevention and Control of COVID-19 (Xinhuanet, 2020), where he put a particular emphasis on on "strengthening the psychological guidance and intervention of the public."

At the beginning of the outbreak, the National Health Commission of People's Republic of China issued guidelines for emergency psychological crisis intervention for people affected by COVID-19 (National Health Commission of China, 2020). Recently, they also published specific guidelines for mental health services (National Health Commission of China, 2020). The Working Committee of Clinical Psychology Registration of the Chinese Psychological Society (CPS) issued a letter of recommendation to all national clinical psychological registrants immediately following the outbreak, encouraging members to participate in the psychological assistance work during the pandemic period.

As telecommunication technologies and health apps have become more available and affordable, they have expanded opportunities for behavioral and mental health professionals to provide quality care (Luxton, Nelson, & Maheu, 2016). As of February 9, there are almost 448 psychological assistance hotlines available either by phone or chat apps inside and outside Wuhan city. Among them are 11 telephone hotlines and eight psychological online support apps providing help mainly for medical workers in Wuhan (*The Paper*, 2020). Hotlines of psychological assis-

tance have been utilized to offer customized counseling services on a one-on-one basis, following the notice on establishing the psychological assistance hotline for the epidemic issued by the Novel Coronavirus Infection Control and Joint Control Mechanism of the State Council (www.gov.cn, 2020).

Soon after professional psychological workers were recruited, the Chinese Psychological Society (CPS) officially launched the "Peace of Mind" programs against epidemic situations. The timeline of the "Peace of Mind" programs was tentatively set from January 2020 to January 2022, and it is divided into two stages: the emergency period and the post- epidemic psychological reconstruction period.

Due to the high infection rate and quarantine needs, traditional face-to-face psychological services cannot be offered. "Peace of mind" programs thus emphasize the application of internet and artificial intelligence technology in publicizing mental health knowledge and constructing psychological hotlines. There are six main types of services in this project.

1. *Online psychological assistance*

This type of service is offered through short-term online consultation and the We-Chat hotline. The Chinese Psychological Society, the Alipay Public Welfare Foundation, Ali Health, and WeChat jointly built a new type of coronavirus national psychological online service platform and embarked on the online service on January 30. The network system can match consultants with clients based on a questionnaire filled out by the client. Up to now, the psychological counseling service on the Alipay platform has received more than 230,000 visits and carried out 6,773 counseling sessions.

2. *Online psychological self-assessment and self-help*

This type of service includes filling out questionnaires which assess levels of anxiety, depression, obsession, and sleep; cognitive behavioral therapy (including reading, self-guidance technology, and multimedia guidance) dealing with the abovementioned problems was provided following the assessment. As of February 3, after it was launched online, more than 4500 people participated in the assessment and completed the CBTi self-help adjustment. Another platform is an app targeting women's mental health. Games were devised to help with relieving negative emotions and pressures, and embedded in the app. This app was officially launched on February 8 and has been utilized by 71,877 people as of the writing of this report.

3. *"Peace of Mind" self-help counseling camp*

Given that the front-line medical staff and clinical psychologists in Wuhan are weighed down with heavy insulation garments, they cannot effectively carry out psychological decompression and counseling. The "Peace of Mind" self-help training camp invented the PM+ project of WHO (World Health Organization, 2016) and made it an online app which guides relaxation training, positive self-cognition training, and mindfulness training for anyone who is seeking social support, especially front-line medical staffs and patients in Wuhan. The training camp lasts for seven days and aims to help participants feel more connected and supported.

4. *"Peace of Mind" self-help training camp*

The "Self-Help Peace of Mind Series Training Camp" is an important part of the "Peace of Mind in the Fight against the Epidemic" action initiated by the Institute of Psychology of the Chinese Academy of Sciences and the Chinese Psychological Society. It aims to provide scientific and effective online self-help for medical workers, patients, and the public affected by the epidemic. "Training Camp" has a personal (patient) version, a medical care version, a parent-child version, and a public version, each aimed at providing help for specific groups of users. The various versions are described below.

1) *Self-Help Peace of Mind Training Camp (public version).* The public version of the Self-Help Peace of Mind Training Camp provides the public with methods and courses for emotional adjustment, helping everyone increase their connections with others in a limited environment and increase their social support. As of now, a total of 25,702 people has participated, and 87,533 check-ins have been recorded.

2) *Self-Help Peace of Mind Training Camp (parent-child version).* The parent-child version of the Self-Help Peace of Mind Training Camp is organized around parent-child and family decompression, with 10–20 minutes of psychological support and counseling a day to accompany and support parents or caregivers in helping them to understand and take care of their children. The counseling aims to help children cope with the stress of the epidemic in a positive and stable state of mind and body, by making the family a spiritual haven for them. As of now, a total of 19,208 people has participated, and 40,747 check-ins have been recorded.

3) *Self-Help Peace of Mind Training Camp (medical care version).* The medical care version of the Self-Help Peace of Mind Training Camp targets frontline medical staff in response to infectious diseases outbreaks and other public health emergencies. It supports medical staff in taking care of themselves through a "psychological intervention with multi-technology integration," which is evidence-based, professional, and convenient. It also aids medical staff in relieving continuous and possible stress, and maintaining a good physical and mental state. So far, 963 people have participated, and 1,759 check-ins have been recorded.

4) *Self-Help Peace of Mind Training Camp (personal version).* The personal version of the Self-Help Peace of Mind Training Camp provides psychological support and self-help psychological counseling for patients with the COVID-19 virus. Up to now, 566 people have participated, and 1,373 check-ins have been recorded.

5. *Mental health training and lectures*

"Peace of Mind lectures" are broadcast live over the whole network. The program invites the most influential experts in the field of psychological crisis intervention in China to provide special lectures and training for all people affected by the epidemic, as well as the volunteers participating in psychological assistance for the fight against the epidemic, through a combination of live broadcast and record-

ings. Multiple platforms have been launched, including Popular Science China, the Chinese Academy of Sciences, the China Science and Technology Museum, the All-China Women's Federation, the Chinese Academy of Sciences Mental Health Service Platform, the Psychological Institute of the Chinese Academy of Sciences Anti-epidemic Column, the Continuing Education Network, and Heart Education. So far, 129 lectures have been broadcast, and the official platform of "Peace of Mind" has accumulated 3,005,588 views.

6. *Psychological assistance to Hubei*

On March, Liu Zhengkui and three others formed a team. They went to Wuhan to carry out psychological assistance work, which was comprised of the following elements:

1. Participating in the analysis and assessment of the psychological assistance policy of the epidemic

Chen Xuefeng, Liu Zhengkui, Wu Kankan, and others visited the Wuhan Conference Center, where the National Health Commission is located, four times, to participate in the research and evaluation of the psychological assistance policy for the epidemic. They then drafted the "Work Plan for Psychological Counseling in the COVID-19 Epidemic," which was issued by the Joint Prevention and Control Mechanism of the State Council on March 18.

The team participated in three seminars organized by the Wuhan Municipal Committee's Political and Legal Committee on the construction of psychosocial services for the epidemic, and then submitted the "Wuhan Psychological Service under the Impact of the COVID-19 Epidemic Work Plan." They also participated in three seminars on psychological counseling and social work service plans organized by the Ministry of Civil Affairs, the Hubei Provincial Department of Civil Affairs, and the Wuhan Civil Affairs Bureau, to discuss the working mechanism of the heart-society linkage and the implementation of the "Five Communities, One Heart" program. They had four discussions on the formulation and promotion of psychological assistance programs with the Women's Federation of Wuchang District, Wuhan City, Hubei Province, and then established a weekly long-term communication mechanism to provide professional support for the Hubei Provincial Women's Federation in carrying out its pilot work.

2. Carrying out pilot psychological services in hospitals and communities

In terms of hospitals, the "Peace of Mind" program conducted investigations and provided services at the Jinyintan Hospital, the Wuhan Special Care Hospital, the Medical Team of the First Affiliated Hospital of the University of Science and Technology of China, and the Anhui Aid to Hubei Medical Team. "Peace of Mind" also provided medical staff with a psychological self-help program. In terms of recovery stations, it carried out investigations and provided services at four isolation points, including Qiaokou Xinhua Printing, Wuhan First Commercial School, the Yangtze River Engineering Vocational and Technical College, and Hubei University.

It also publicized psychological information to help recovered patients and staff at the isolation points, and provided self-help procedures and online and offline one-on-one psychological services.

In terms of the community, it conducted investigations and provided services in the Kaiyuan Mansion Community and Jindi Garden Community in Qingshan District. It also provided psychological counseling for community officials, volunteers, and other staff. Self-help services were provided to residents. This program regularly visits the station at Hongshanfang, a pilot community of the Women's Federation of Hubei Province, to provide professional guidance to community psychologists.

3.   Providing multi-technology integration of support for application services

"Peace of Mind" adopted a combination of online and offline methods for conducting extensive psychological research and service work during the epidemic. It distributed emotion-monitoring bracelets on-site in the lobby of the outpatient building of Jinyintan Hospital, to accumulate raw data and carry out scientific research while providing services for frontline medical staff and recovered patients who came for follow-up visits. It developed a variety of online mini-programs, online questionnaires, etc., and carried out epidemiological investigations and intervention studies for different groups of pregnant women, medical staff, and patients.

4.   Providing psychological assistance for long-term positive patients

On April 20, a team led by Professor Shi Zhanbiao began to provide psychological assistance to 51 long-term positive patients with COVID-19 in Wuhan Jinyintan Hospital. The assistance includes multi-technology integrated psychological assistance, individual counseling, group counseling, and psychological science publications, among other services.

5.   Providing psychological assistance for community residents

"Peace of Mind" joined with the Hubei Provincial Women's Federation, Wuchang District Women's Federation, Wuhan Huaxia Psychology, and others to establish a trinity team of community psychological service, which consisted of psychologists, psychological counselors, and community women's federation cadres in the Dongting, Bairuijing, and Hongshanfang communities in Wuchang District. This work was carried out in a fixed community in tour service mode one day per week; each household was provided psychological support twice.

The program also established a demonstration site called "Picture Book Home" in the Donghu Community, Liyuan Street, Hongshan District, where it provided 431 picture books and other books for children. It also provided 200 relief supply kits for children in need in the Hongshan, District, and Qingshan Districts, and presented one lecture on family psychological support for children affected by the epidemic in Wuhan. In addition, it administered a survey on the community residents' mental health situation. The mental health questionnaires of 1225 females and four mental health questionnaires for pregnant women residents were collected.

7. *Collaboration with social workers' "Thousands of Institutions Send Peace of Mind"*

On February 2, "Peace of Mind" action launched the "Thousands of Institutions Send Peace of Mind" project, which was guided by the Psychological Service Organization Working Committee of the Chinese Psychological Society, the Crisis Intervention Working Committee of the Chinese Psychological Society, and the

Beautiful Community Program Office of the Chinese Social Work Federation. Under the overall planning of the National Psychological Service Organization Consortium, it has led thousands of social psychological service organizations, and social organizations to serve the key populations, communities, and families. Based on the communities, social organizations, and social workers, it assisted frontline workers and completed nine key public welfare psychological assistance tasks.

As of now, 590 organizations across the country have applied for this project, 520 organizations have undergone evaluation and review by the Executive Committee of "Peace of Mind," 390 psychosocial service organizations have been publicized, and 356 organizations have submitted work data feedback. The feedback data are as follows: 356 organizations have provided services to 2,576 designated groups, including 105,365 hotline services; 80,765 online questionnaires; 188,065 psychological assessments; 65,953 individual consultations; and 2,292,759 public welfare class services. The audio/video programs have recorded 3,541 visits, with 2,067,290 hits to play, and 5,794 popular science articles have been published, receiving 1,399,084 hits to read.

Conclusion

In summary, various mental health services and supports are taking place to help citizens cope with mental health concerns due to the outbreak of COVID-19. They are facilitating the development of China's public emergency interventions and eventually could improve the quality and effectiveness of emergency interventions in China.

In addition to the aforementioned techniques, we identified several areas within the organization and management of psychological intervention activities to focus on in the future. The Wuhan Workstation of Psychological Assistance has become an important base for psychological services in response to the epidemic, and an important platform for the psychological service to complete 13 independent scientific research projects on psychological services for sufferers from the epidemic. The Workstation plans to carry out a two-year program of front-line psychological assistance and scientific research work. It will continue to systematically promote psychological services for epidemic prevention and control at three levels:

1. Promote the work of pilot hospitals and communities, refine service targets and research groups, and provide grief counseling for the families of the deceased, psychological counseling for the elderly, and psychological counseling for students returning to school. Provide psychological services to employees, family members, and students of the Wuhan branch system.

2. In response to special public health emergencies such as infectious diseases, focus on developing key technologies and network service platforms for epidemic prevention and control of "multi-technology-integrated psychological intervention"; coordinate with the mental health service platform of the Chinese Academy of Sciences; and explore psychological assistance with the support of the new model of "multi-technology integrated psychological intervention."

3. Strive to build a sound national emergency management system for major events, research the goals and ways of building such a psycho-social service system in China, and explore and promote its legalization, institutionalization, and stan-

dardization. Provide frontline experience and knowledge which cannot be replaced by the national strategic scientific and technological power of the Psychological Institute, CAS and the Chinese Psychological Society (CPS).

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DEVELOPMENTAL PSYCHOLOGY

Digital Socialization of Adolescents in the Russian Federation: Parental Mediation, Online Risks, and Digital Competence

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Background. Digital socialization is understood to be mediated by all available digital technological processes for mastering and appropriating a social experience online. Understanding of this new type of socialization requires studying parental mediation strategies for children's online activity, as well as the level of digital literacy of both children and parents, including through the prism of adolescents' confrontation with online risks.

Objective. To study digital socialization and the role of parents in this process; to reveal relationships between parental user activity, mediation, and digital competence, and adolescents' user activity, digital competence, and experience of online risks.

Design. The study was conducted on the basis of the EU Kids Online 2017–2019 survey methodology. The sample consisted of 1,553 schoolchildren aged 12–17 and 1,219 parents of adolescents the same age, all from the Russian Federation.

Results. The findings show that parents underestimate the online risks faced by adolescents, especially the most common communication and content online risks. Adolescents often do not notice parental "restrictive" and "active" mediation of their online activities. Adolescents' request for parental help with their online difficulties depends not on the parents' digital competence, but on their active mediation. In following parental active mediation and safety mediation strategies, adolescents are more likely to face online risks, but at the same time they use active coping strategies. The negative relationship between the adolescents' digital competence and parental restrictive mediation and technical control suggests that excessive control and limitations hinder the development of knowledge and skills in the safe mastering of the Internet.

Conclusion. The digital gap between adolescents and parents is observed both in confrontation with online risks and awareness of this experience, and in the application of parental mediation strategies. Parental active mediation provides stronger digital socialization and more constructive ways of coping with the threats of the digital world — online risks, which are the consequence of deep immersion into this world.

Keywords:
digital
socialization,
adolescents,
parental
mediation,
digital
competence,
online risks

Introduction

Digital technologies today are a major socialization agent that contends with family and school. The uniqueness of the younger generation is that traditional forms of socialization increasingly coexist with, and are crowded out and sometimes replaced by, new ways of acquiring the necessary knowledge and skills — digital socialization (Smith, Hewitt, & Skrbiš, 2015; Soldatova, 2018; Stornaiuolo, 2017). Digital socialization is understood as being mediated by all available digital technological processes of mastering and appropriating social experiences acquired online (Soldatova, 2018). Adolescents, as the most active Internet users, are at the forefront in the development of digital technologies. Studies have shown that a new lifestyle in the digital world creates a special social situation for the development of a child, which is characterized by a decrease of dominance of the adult in parent–child relationships in online contexts and mixed reality (Soldatova, Rasskazova, & Nestik, 2017).

This situation is determined by the digital gap between the generations of children and parents. Many parents do not quickly learn about digital technologies, and this determines the prevalence of children's independent and spontaneous development and use of them. This, however, does not contribute to the formation of a sufficient level of digital competence among children and adolescents, who are still very much in need of the support of adults, primarily their parents, both to develop new online opportunities and to cope with online risks.

Digital competence can be understood as consisting of (1) technical competence; (2) the ability to use digital technologies in a meaningful way for working, studying, and in everyday life; (3) the ability to evaluate digital technologies critically; and (4) motivation to participate in and commit to the digital culture (Ilomäki, Paavola, Lakkala, & Kantosalo, 2016). In this paper, we rely on the definition of digital competence as a personal capability and readiness to make confident, effective, critical, and safe choices and the implementation of digital technologies in various domains (information, communication, consumption, and the technosphere), which are based on continuous learning competencies (system of knowledge, skills, motivation, and responsibility) (Soldatova & Rasskazova, 2014).

Assessing the opportunities for adults and especially parents to participate in the role of experts in digital socialization and the effective and safe use of technologies, requires studying parental mediation strategies for children's online activity, as well as the level of digital literacy of both children and parents, including through the prism of adolescents' confrontation with online risks (Clark, 2012; Haddon, 2012; Helsper, Kalmus, Hasebrink, Sagvari, & de Haan, 2013; Ilomäki et al., 2016; Khurana, Bleakley, Jordan, & Romer, 2015; Lau & Yuen, 2013; Leung & Lee, 2012; Livingstone, Haddon, Görzig, & Ólafsson, 2011; Livingstone et al., 2017; Nathanson, 2015; Nikken & Schols, 2015; Smahelova, Juhová, Cermak, & Smahel, 2017; Shin, 2013; Soldatova & Rasskazova, 2014; Soldatova & Rasskazova, 2016; Vaala & Bleakley, 2015).

The digital competence of both parents and adolescents can mediate the choice of parental mediation strategies. These can be active mediation of Internet use (actively discussing and/or sharing the activity); active mediation of Internet safety; restrictive mediation (the establishment of rules that limit and regulate online time, the place of use, activities); technical controls; and monitoring (checking on the

child's online activities after use) (Livingstone et al., 2011). Mediation strategies can also help the child with the experience of dealing with online risks: communication (rude or inappropriate); technical (password theft or computer viruses, spyware and other programs that interfere with system operations, online theft of personal data or misuse of personal information); content (inappropriate or harmful); and consumer risks (online fraud, cash theft or unwanted spending) (Soldatova, Shliapnikov, & Zhurina, 2015).

The aim of the present study was to find relationships between parental user activity, mediation, and digital competence, on the one hand, and adolescents' user activity, digital competence, and experience of online risks on the other. We hypothesized that:

Hypothesis 1: There is a discrepancy in appraisals of online risks and parental mediation strategies between parents and adolescents: Adolescents report higher online risk and lower parental mediation than do parents.

Hypothesis 2: Personal meetings with online friends are among the most frequent online risks for adolescents. Other widespread risks include cyberaggression and negative content (violent, aggressive, hateful, sexual, etc.). Older adolescents more frequently report experience of online risks; there are almost no gender differences among them.

Hypothesis 3: Parental digital competence is related to adolescents' readiness to ask for their help, more productive strategies of coping with online risks, and lower risks related to misuse of personal information and being cheated online.

Hypothesis 4: Parental active mediation and safety mediation are related to higher readiness of adolescents to tell them (and possibly others) about their stressful experience online, more productive strategies of coping with online risks, and lower risks related to cyberaggression, misuse of personal information, and being cheated online.

Hypothesis 5: Parental restriction and technical mediation are related to lower online risks, but also to adolescents' poorer communication and technical abilities for coping with them (like how to change privacy settings), and trying to keep online risks secret.

Methods

Participants

The study involved 1,553 adolescents aged 12–17 years and 1,219 parents of adolescents the same age from eight federal districts (15 cities) of the Russian Federation. Among the schoolchildren, 471 were aged 12–13 years (218 boys — 46.3%; 241 girls — 51.2%; 12 did not indicate gender — 2.5%) and 1,082 were aged 14–17 years (493 boys — 45.6%; 541 girls — 50.0%; 48 did not indicate gender — 4.4%).

Among parents, 220 participants were men (18.0%), 959 were women (78.7%), and in 40 cases gender was not indicated (3.3%). In the group of parents, 409 people answered about their children 12–13 years old (33.6%); 796 (65.3) about adolescents 14–17 years old; 14 did not specify the age of their child (1.1%). The sample comprised 510 parents of boys (41.8%), 645 parents of girls (52.9%), and in 64 cases these data were omitted (5.3%).

The sample of adolescents and parents was balanced according to their place of residence (relevant city districts) and the socioeconomic status of their families.

Measures

The study was conducted mostly on the basis of the EU Kids Online 2017–2019 survey methodology (Smahel et al., 2020). Findings were made by the following methods:

User activity. The assessment of user activity included two questions: "About how long do you spend on the Internet during a regular weekday (school day)?" and "About how long do you spend on the Internet during a regular weekend day?" There were 14 possible answers for each item, ranging from "Almost no time" and "Less than half an hour per day" to "12 hours per day and more".

Parental mediation. To rate parental technical control, adolescents were asked, "Does your parent/guardian make use of any of the following…?" and parents were asked, "Do you (or another parent/guardian) make use of any of the following…?" The question consisted of seven items with the possible answers "Yes"/"No", e.g., "Parental controls or other means of blocking or filtering some types of content", and "Parental controls that filter the apps I can download".

Parental active mediation and parental safety mediation were studied with the question for adolescents, "When you use the Internet, how often does your parent/guardian do any of these things?" and for parents, "When your child uses the Internet, how often do you do these things?" The questions for rating parental active mediation included four items (e.g., "Encourages me to explore and learn things on the Internet"). The questions for rating parental safety mediation included five items (e.g., "Talks to me about what to do if something online bothers or upsets me"). The answers to the question were estimated on a Likert Scale from 1 ("Never") to 5 ("Very often").

For appraisal of parental restriction, adolescents were asked, "Does your parent/guardian allow you to do the following things on the Internet, and if so, do you need their permission to do them?" and parents were asked, "Do you allow your child to do the following things on the Internet and if so, do they need your permission to do them?" The questions included five items, for example, "Use a social networking site", "Play games with other people online". Answers were estimated on a Likert Scale from 1 (e.g., "I am allowed to do this anytime") to 4 (e.g., "I do not know if I am allowed to do this").

For appraisal of adolescents' request for parental mediation, adolescents answered the following question: "Have you ever done any of these things?" The question consisted of three items and was estimated on a Likert Scale from 1 ("Never") to 5 ("Very often"), e.g., "Told my parent/guardian about things that bother or upset me on the Internet".

Online risks. To evaluate the child's confrontation with general online risks, a question was asked with two possible answers ("Yes"/"No") for both adolescents and parents: "In the past year, has anything ever happened online that bothered or upset you in some way (e.g., made you feel upset, uncomfortable, scared, or made you think that you shouldn't have seen it)?"

Two questions were asked about finding support and coping strategies in the following situation: "The last time something happened online that bothered or upset you, did you talk to any of these people about it?" (10 options were possible, e.g., "My mother or father", "A teacher") and "The last time you had problems with something or someone online that bothered or upset you in some way, did you do any of these things afterwards?" (13 options, e.g., "I ignored the problem or hoped the problem would go away by itself").

Some of the questions were about concrete risks. Communication risk assessment included questions about meeting strangers (two items, for example, "In the past year, have you ever met anyone face-to-face whom you first got to know on the Internet?") and cyberaggression (two items, e.g., "In the past year, how often did this happen in any of the following ways? Via a mobile phone or Internet, computer, tablet, etc."). Confrontation with content risks was studied by asking, "In the past year, have you seen online content or online discussions where people talked about or showed any of these things?" with seven items (e.g., "Ways of committing suicide"). To assess confrontation with technical and consumer risks, the following question was asked: "In the past year, has any of the following happened to you on the Internet?" with seven items (e.g., "The device I use got a virus or spyware", "I lost money by being cheated on the Internet"). Parents responded about their children's experience.

Digital competence. We used the Brief Index of Digital Competence (IDC) (Soldatova & Rasskazova, 2018), which consists of four scales: Knowledge (eight items, "The possibilities of providing information about myself on the Internet and the ways to limit access to it are well known to me"), Skills (eight items, "Creating several user accounts for a specific computer: I have done it and know how to do it on the Internet"), Motivation (eight items, "I would like to learn how to use the Internet effectively for shopping, using payment systems and Internet banking"), and Safety (eight items, "Determine which files are worth downloading and which are not: I know how to do this").

Procedure

The survey used the personal interview method and questionnaires for each age group. Forty-eight experienced interviewers/psychologists were selected for conducting the survey via a university network. Questions were asked to respondents individually, face-to-face. Adolescents took part in the survey only if they use the Internet. Parents took part only if they had children aged 12–17 who use the Internet. The parent interview was conducted with the parent who knew most about the child and their Internet use. The participants were informed about the study's objectives and its voluntary and confidential nature.

Data Analysis

Statistical analysis included Student's t-test and correlational analysis. Taking into account our sample sizes, the *p*-level for rejecting the null hypothesis was chosen to be $p < .01$. For all the scales' consistency, Cronbach's alpha varies from acceptable (.66–.70) to good (> .80).

Results

User Activity, Online Risks, Digital Competence, and Parental Mediation: Comparisons of Children and Parents

As expected, adolescents spent more time online than their parents (*Table 1*). Possibly as a result, they are more skilled (both for technical skills and safety) online, but there are no differences in knowledge about and motivation to improve digital competence between adolescents and parents. Interestingly, adolescents appraise any parental mediation (both active participation and restriction) as lower than parents do. In other words, there is a discrepancy between parental intentions to participate and adolescents' subjective perception of parental mediation, such that the adolescents underestimate and/or the parents overestimate the mediation. The same pattern was found for adolescents' active search for parental help: Adolescents appraise it as lower than parents do.

Boys and girls did not differ by digital competence and parental mediation, but girls spent more time on the Internet, more frequently combined it with other daytime activities, and asked for parental mediation ($t = -3.76 - -2.78$, $p < .01$, $\eta^2 = .01$). However, effect sizes for these differences were rather low.

Table 1

User activity, digital competence, and parental mediation: Comparison of adolescents and parents

Scales	Adolescents		Parents		Student's t-test	Effect size η2
	Mean	Std. Deviation	Mean	Std. Deviation		
User activity	6.61	2.94	4.77	2.52	17.31**	.10
Parental mediation — Technical control	.18	.26	.38	.35	−16.43**	.10
Parental mediation — Active mediation of Internet use	2.43	.85	3.02	.76	−18.78**	.11
Parental mediation — Safety mediation of Internet use	2.41	1.05	3.08	.97	−17.08**	.10
Parental mediation — Restrictions	1.31	.57	1.57	.73	−1.20**	.04
Adolescents' request for parental mediation	2.14	1.03	2.57	1.00	−1.83**	.04
IDC — Knowledge	51.93	33.95	47.18	31.70	1.85	.01
IDC — Motivation	35.36	30.88	37.42	29.22	−.87	.00
IDC — Skills	59.26	32.34	40.78	27.61	7.82**	.09
IDC — Safety	60.09	33.72	39.52	31.91	8.04**	.09
IDC — General	51.75	22.21	41.13	19.38	6.50**	.06

*Note: IDC = Index of Digital Competence. ** p < .01.*

Table 2

Online risks to adolescents: Comparison of parents' and children's appraisals

Online risks	Adolescents	Parents' appraisals	Pearson's χ^2	Cramer's V
General online risks	48.3%	32.5%	58.18**	.16
Contact with strangers on the Internet	64.5%	46.9%	74.45**	.18
Meeting offline with Internet acquaintances	47.4%	15.2%	247.19**	.35
Cyberaggression — Victim (at least once per month)	23.4%	–	–	–
Cyberaggression — Aggressor (at least once per month)	14.1%	–	–	–
Somebody used my personal information in a way I didn't like	14.1%	7.5%	26.84**	.10
The device I use got a virus or spyware	15.8%	11.9%	7.71**	.06
I lost money by being cheated on the Internet	12.8%	11.8%	.55	.02
Somebody used my password to access my information or to pretend to be me	15.9%	4.7%	78.58**	.18
Somebody created a page or image about me that was hostile or hurtful	7.2%	9.2%	3.60	.04
I spent too much money on in-app purchases or online games	11.0%	23.3%	68.85**	.17
Someone found out where I was because they tracked my phone or device	5.4%	2.2%	11.44**	.07
I saw online: Ways of physically harming or hurting oneself	53.0%	20.6%	256.23**	.33
I saw online: Ways of committing suicide	27.7%	6.0%	183.62**	.27
I saw online: Ways to be very thin	50.5%	22.4%	197.29**	.28
I saw online: Hate messages that attack certain groups or individuals	51.9%	18.8%	276.23**	.34
I saw online: Experiences of taking drugs	31.1%	11.5%	129.47**	.23
I saw online: Gory or violent images, for example of people hurting other people or animals	25.0%	22.2%	2.21	.03
I saw online: Obscene pictures or videos	52.7%	16.3%	269.68	.35

Note: ** $p < .01$.

Comparisons of adolescents 12–13 and 14–17 years old reveal no differences in digital competence and parental active mediation, but adolescents 12–13 years old spent less time online ($t = -8.97 - -1.91$, $p < .01$, $\eta^2 = .05-.08$), more frequently ask for parental mediation ($t = 3.94$, $p < .01$, $\eta^2 = .01$), and more frequently reported

parental safety mediation, parental control, and restrictions *(t = 5.88–6.21, p < .01,* η^2 = .03).

As shown in *Table 2*, almost one in two adolescents reported experience of encountering online something that disturbed or upset them. The most frequent online risks include communication with strangers, seeing ways of causing physical harm to other people, losing weight, aggressive messages to groups or individuals, obscene pictures or videos. Rarely do adolescents report that they were initiators of cyberbullying, that their personal information was misused, that they were cheated online, or spent too much money online, or their device was infected by a virus. However, even for these situations, more than one adolescent out of ten had such an experience. For almost every online risk (except cheating online, unpleasant content, and gory or violent images), there are differences between adolescents' reports and parental appraisals. In most cases, parents underestimate online risks and probably do not know that their children have experienced them. The only exception is spending too much money online: Parents appraise this risk much higher than do adolescents.

Girls more frequently than boys (55.5% versus 40.4%, χ^2 = 29.70, *p* < .01, Cramer's V = .15) report that they encountered online something that disturbed or upset them. There were no gender differences in general coping with online risks except one: Girls more frequently reported the problem online (clicked on a "report abuse" button, contacted an Internet advisor; 11.1% versus 5.7%, χ^2 = 7.20, *p* < .01, Cramer's V = .10). Girls less frequently than boys reported that they initiated cyberaggression at least once per month (8.7% versus 19.6%, χ^2 = 20.94, *p* < .01, Cramer's V = .17) and that they spent too much money online (7.8% versus 14.3%, χ^2 = 15.23, *p* < .01, Cramer's V = .10). They more frequently reported that they saw content describing ways of weight loss (60.7% versus 39.4%, χ^2 = 63.04, *p* < .01, Cramer's V = .21). No other gender differences in the experience of online risks were found.

Surprisingly, there were no age differences in general online risks and just a few differences in ways of coping with them. Adolescents 14–17 years old more frequently change privacy settings after experience of risks online than do those 12–13 years old (18.9% versus 9.5%, χ^2 = 12.35, *p* < .01, Cramer's V = .12) and report the problem online (11.8% versus 4.4%, χ^2 = 11.93, *p* < .01, Cramer's V = .12). Also older children more frequently identify as "friends" people whom they do not know personally (72.3% versus 47.7%, χ^2 = 82.52, *p* < .01, Cramer's V = .24) and meet them offline (51.9% versus 34.6%, χ^2 = 23.01 *p* < .01, Cramer's V = .15), more frequently report being aggressors in cyberbullying at least once per month (17.6% versus 10.7%, χ^2 = 87.51, *p* < .01, Cramer's V = .33), lost money or were cheated online (15.1% versus 7.7%, χ^2 = 15.50, *p* < .01, Cramer's V = .10), spent too much money online (13.2% versus 6.6%, χ^2 = 13.93, *p* < .01, Cramer's V = .10). Older adolescents more frequently encounter almost every one of the listed online risks related to negative content (ways of causing physical harm, committing suicide, losing weight, aggressive messages, experience of taking drugs, cruelty or violence, obscene pictures, χ^2 = 26.76–83.37, *p* < .01, Cramer's V = .14–.25) — probably because they are more active online or because they are intentionally looking for such context.

Relationship Between Parental Mediation, Parental Digital Competence, and Adolescents' User Activity and Online Risks

Parental mediation strategies are almost unrelated to adolescents' user activity. Parents reporting higher active and safety mediation appraise their children as more active online than parents reporting lower active and safety mediation, but adolescents' data do not support this result. However, active parental participation and safety mediation are indeed associated with adolescents' readiness to ask parents for help and tell them about online problems. This result is supported by both the adolescent and parent data. Higher parental restrictions and technical control are related to lower adolescent digital competence. Interestingly, higher restrictions correlate with lower digital skills and safety, while higher technical control is related to less knowledge about the Internet. Parental digital competence was unrelated to their children's readiness to ask for their help.

General Online Risks

Both adolescents' and parents' digital competence were unrelated to general online risk experience, but adolescents who reported the experience of something that disturbed them online were more active users that adolescents who denied having this experience ($t = -4.36 - -3.40$, $p < .01$, $\eta^2 = .01$). They also more frequently asked their parents to help with something online ($t = -5.96$, $p < .01$, $\eta^2 = .03$) and felt more active mediation and safety mediation from parents in their Internet use ($t = -3.15 - -2.90$, $p < .01$, $\eta^2 = .01$). There were no differences in their appraisals of parental restrictions and technical control.

Parents who reported that their children experienced something that disturbed them online described their children as actively asking for help regarding their online activities ($t = -12.94$, $p < .01$, $\eta^2 = .15$) and were rated higher on parental active and safety mediation ($t = -9.17 - -4.17$, $p < .01$, $\eta^2 = .02 - .08$).

Adolescents who reported higher active and safety parental mediation ($t = -9.96 - -6.34$, $p < .01$, $\eta^2 = .05 - .11$) and fewer restrictions ($t = 3.41$, $p < .01$, $\eta^2 = .01$) more frequently told their parents about their problem online. Interestingly, active and safety parental mediations were also related to sharing the experience of online risk with brothers and sisters ($t = -6.43 - -4.25$, $p < .01$, $\eta^2 = .02 - .05$).

Adolescents reporting higher technical parental control are less frequently inclined to share their experience of online risk with a friend ($t = 3.12$, $p < .01$, $\eta^2 = .01$), while those reporting lower safety parental mediation more frequently keep their experience secret ($t = 3.50$, $p < .01$, $\eta^2 = .02$).

Higher subjective active and safety parental mediation in adolescents was related to closing apps or windows when feeling anxious or disturbed online ($t = -4.29 - -3.77$, $p < .01$, $\eta^2 = .02$). Higher safety parental mediation is related to changing of privacy settings as a reaction to online risk ($t = -2.76$, $p < .01$, $\eta^2 = .01$). Adolescents experiencing more parental restrictions less frequently block other people from communication with them and less frequently report a problem online (e.g., by clicking on a "report abuse" button or contacting an Internet advisor, $t = 3.06 - 3.27$, $p < .01$, $\eta^2 = .01$). No other differences in reaction to online risk related to parental mediation strategies were found.

Table 3

Relationships of parental mediation strategies to adolescents' user activity, asking for mediation, digital competence, and experience of cyberaggression (parental appraisals are given after "/")

Adolescents' user activity, digital competence and experience of cyberaggression	Parental mediation — Technical control	Parental mediation — Active mediation of Internet use	Parental mediation — Safety mediation of Internet use	Parental mediation — Restrictions
User activity	−.12** / .04	−.01/ .15**	−.14**/.16**	−.12**/−.07*
Adolescents' request for parental mediation	.28** / .09**	.50** /.41**	.66** /.61**	.14** /−.01
IDC — Knowledge	−.22**	−.09	−.09	−.17**
IDC — Motivation	−.06	.02	.02	.02
IDC — Skills	−.18**	−.05	−.03	−.25**
IDC — Safety	−.14*	.00	.08	−.22**
IDC — General	−.22**	−.05	.00	−.24**
Experience of cyberaggression as a victim	.05	.05	−.04	.04
Experience of cyberaggression as an initiator	.06	−.02	−.08*	.01

*Note: IDC = Index of Digital Competence; * p < .05; ** p < .01.*

Online Communication Risks

Adolescents communicating online with strangers and making friends with them report less parental technical control, restriction, and safety mediation ($t = 3.58–5.70$, $p < .01$, $\eta^2 = .01–.02$). Parents informed that their children communicate with strangers online report lower technical control and restrictions ($t = 2.84–5.43$, $p < .01$, $\eta^2 = .01–.03$), but not less safety mediation. However, none of the parental strategies were related to personal meetings with online friends (which are typical for almost 50% of the adolescents).

Frequency of experience of cyberaggression (as a victim) and initiation of cyberaggression (as an antagonist) were unrelated to parental mediation (see *Table 3*).

Online Content Risks

Adolescents with higher parental restrictions and technical controls rarely reported that they saw ways of causing physical harm online ($t = 3.36–3.54$, $p < .01$, $\eta^2 = .01$). Seeing dangerous ways of losing weight online corresponded to higher active and safety parental mediation ($t = -2.95 – -2.83$, $p < .01$, $\eta^2 = .01$), but lower restrictions ($t = 2.78$, $p < .01$, $\eta^2 = .01$). Higher subjective parental restrictions were also more typical of those who reject seeing hate messages that attack certain groups or individuals online ($t = 3.25$, $p < .01$, $\eta^2 = .01$). Experience of seeing drug use was related to lower safety mediation only ($t = 3.94$, $p < .01$, $\eta^2 = .01$). Experience of seeing images of cruelty and violence was related to higher active parental mediation only ($t = -3.71$, $p < .01$, $\eta^2 = .01$). There were no differences in parental mediation between those who

reported seeing ways of committing suicide online and those who did not, or between those who reported that they saw sexual images online and those who did not.

Parents using more restrictions and technical controls rarely reported that their children saw dangerous ways of losing weight online ($t = 2.77–4.54$, $p < .01$, $\eta^2 = .01–.02$). Those using more restrictions rarely reported that their children encountered content about physical harm ($t = 3.42$, $p < .01$, $\eta^2 = .01$), using drugs ($t = 3.14$, $p < .01$, $\eta^2 = .01$), images of cruelty or violence ($t = 4.69$, $p < .01$, $\eta^2 = .02$), or sexual images ($t = 4.60$, $p < .01$, $\eta^2 = .03$). Having seen hate messages online is related to lower parental restrictions and technical control ($t = 4.36–5.91$, $p < .01$, $\eta^2 = .01–.03$), but higher safety mediation ($t = -4.04$, $p < .01$, $\eta^2 = .02$).

Technical and Consumer Online Risks

Adolescents who reported that their devices were infected by a virus appraised their parental technical control, restrictions and active mediation as higher ($t = -4.83 – -2.77$, $p < .01$, $\eta^2 = .01–.02$) while adolescents who reported that somebody misused their password or created unpleasant content about them online, or that they had lost too much money online also appraise their parental technical control and restrictions as higher ($t = -5.27 – -2.75$, $p < .01$, $\eta^2 = .01–.02$). Adolescents who were cheated or lost money on the Internet described their parents as higher in active and safety mediation *($t = -3.99 – -3.75$, $p < .01$, $\eta^2 = .01$).* In the sample of adolescents, risk of misuse of personal information was unrelated to parental mediation.

Parents who reported that their children experienced misuse of their personal information online were lower in restrictions ($t = 3.31$, $p < .01$, $\eta^2 = .01$) and higher in safety mediation ($t = -2.89$, $p < .01$, $\eta^2 = .01$) compared to those who do not. Infection of an adolescent's device by a virus was more frequently reported by parents with lower restrictions ($t = 3.08$, $p < .01$, $\eta^2 = .01$).

Discussion

Online risks and parental mediation: divergence in assessments of adolescents and parents. According to our **first hypothesis**, adolescents are much less likely than their parents to note any strategies of their parents to participate in their online activities — both restrictions and support. With regard to most of the online risks, especially regarding communication (meeting strangers) and content (encountering negative content), adolescents note that they had had such an experience, and parents mostly deny it. The exception is spending too much money online, which parents note more often than adolescents, most likely due to ambiguity in the wording regarding what is considered "too much" money for an adolescent.

In our view, the discrepancy in the estimates of parental mediation partly reflects the general discrepancy between purposeful participation (desired by the initiator) and subjectively perceived (by the recipient) participation. In other words, adolescents tend not to notice and underestimate their parents' actions, both restrictive and supportive, and parents tend to believe that they are doing more than their children actually notice. From a practical point of view, this result is important because parents may have the illusion that they are doing everything they can to help their child online, whereas adolescents do not follow their parents' restrictions, simply because they do not notice them. In contrast to the discrepancy in the assessment of

parental mediation, the discrepancy in the assessment of online risks is apparently due to the lack of awareness on the part of parents and their underestimation of risk.

Online risks and their dependence on adolescent gender and age. According to our **second hypothesis**, the online activity of Russian adolescents cannot be called safe. Our results are consistent with data from other studies on children in different countries (Blum-Ross & Livingstone, 2016; Livingstone et al., 2011; Lupiáñez-Villanueva et al., 2016; Ofcom, 2016; Soldatova & Rasskazova, 2016). Almost every second child meets in person with those whom he or she had talked with only on the Internet, and more than half came across a description online of how to cause physical harm, as well as sexual content, hateful messages in relation to individuals and groups of people, and methods for excessive weight loss. One adolescent out of three or four notes having been a victim of cyberaggression, having seen descriptions of suicide methods, someone's drug use experience, images of cruelty and violence. One out of ten has experienced the abuse of personal information online, password theft, or fraud. Content and communication risks are most prevalent (Livingstone et al., 2011; Lupiáñez-Villanueva et al., 2016; Ofcom, 2016; Ofcom, 2018). Adolescents aged 12–13 spend less time online than those aged 14–17, but age-related differences in digital competence and exposure to online risks are fewer than similarities (Lupiáñez-Villanueva et al., 2016; Ofcom, 2016).

Adolescents aged 12–13 are no less competent online than those aged 14–17 (at least based on their assessment of their specific knowledge and skills). However, when faced with online risks, older adolescents are more likely to report a problem online and change the privacy settings of their profile. Given that adolescents aged 12–13 years often also know how to do this (they possess the necessary skills), we can assume that older adolescents are more psychologically prepared to solve problems online at a technical level, perceiving them as everyday problems that are technical in nature and do not affect them personally.

With regard to specific online risks, the second hypothesis has also been confirmed: Adolescents aged 14–17 are more likely to meet in person with online friends. These results are consistent with a study showing that when using social media, half of secondary school pupils and over one quarter of primary school pupils have communicated with people they do not know (Clarke & Crowther, 2015). Adolescents aged 14–17 are subject to online fraud, initiate cyberaggression, and encounter almost any negative content. Contrary to the second hypothesis, girls are more likely than boys to say that something upset or worried them online, but when comparing the frequency of individual online risks, the differences between boys and girls are minimal. Boys more often say that they are aggressors online and spend too much money on the Internet, whereas girls say that they see information about methods of excessive weight loss.

Parental mediation and the exposure of adolescents to online risks. Contrary to our **third hypothesis** and the results of other studies (Clark, 2011; Livingstone et al, 2017; Nikken & Schols, 2015; Pasquier, Simões, & Kredens, 2012; Shin & Huh, 2011), the digital competence of parents is hardly connected at all to the willingness of adolescents to ask for their help and report problems online, and is not related to online risks and coping strategies. In our view, this result is explained by the fact that more successful and trusting interaction of children and parents about the Internet does not depend on the knowledge and skills of the parents, but on the interest, trust, or, conversely, the restrictions that are created in this interaction. According to

this explanation, adolescents often turn to parents who adhere to active mediation and safety mediation, regardless of the restrictions and control they exert.

Unlike parental digital competency, parental mediation strategies, although not related to adolescent user activity and the risk of overuse of the Internet, involve a series of other online risks, as well as digital competence. In line with **Hypothesis 4**, active parental mediation and safety mediation, according to estimates of both adolescents and parents, are associated with a greater willingness on the part of adolescents to ask their parents for help. In contrast, as **Hypothesis 5** predicts, parental technical controls and restrictions are associated with lower digital competencies on the part of adolescents. One can assume that restrictions and control impede the formation of user skills, including the skills of safe use of the Internet.

If we combine the results obtained on the relationship between parental mediation strategies and online risks, active mediation and safety mediation strategies are associated with a greater likelihood that adolescents who encountered these online risks (according to both the adolescents and their parents) would tell their parents and brothers or sisters about them. As well as the fact that in a conundrum online, an adolescent will simply close the page that caused negative feelings. The data indicate that adolescents are more likely to face some content-related risks when there is active parental mediation, and online fraud is more common among adolescents whose parents support their user activity. Similar findings are presented in studies conducted under the supervision of S. Livingstone (Livingstone et al., 2017). Thus, active mediation is not only associated with higher risks, but also opens up more opportunities for coping with them.

Parental mediation of security is additionally related to the fact that adolescents will try not to hide what happened, but to share it with at least someone, as well as change their privacy settings after facing online risks, and are less likely to make friends with those whom they do not know offline.

Restriction and technical control strategies with a common likelihood of adolescents encountering online risks are not associated with each other, but are associated with a lesser likelihood of online dating (although not related to the likelihood of personal meetings with online acquaintances). Restrictions from parents are less likely to mean that an adolescent will tell them about an online problem that has arisen, block contacts with those who have bothered or upset them online, or complain online about the problem. Although according to parents, restrictions and technical control are associated with a lower risk of adolescents encountering negative content, according to adolescents, this is true only for certain types of content. These results are partly consistent with the findings that using restrictive mediation reduces the encounter with online risks (Chang et al., 2015; Lau & Yuen, 2013; Mesch, 2009).

Limitations and control are connected with the fact that adolescents are less likely to encounter online methods of physical abuse, losing weight, and hateful messages (Chang et al., 2015; Lau & Yuen, 2013; Mesch, 2009; Ofcom, 2016). However, an encounter with someone else's experience in using drugs is associated only with a lower level of security mediation, and an encounter with an image of cruelty is associated with more active mediation. Similarly, if, according to the parents, the restrictions are associated with a lower risk of infection of the adolescent's digital device with a virus and the abuse of personal information, then, according to the adolescents, technical control and restrictions are associated with a greater risk of the device's damage, password theft, and excessive cash costs.

In general, the data indicate that the advantages of restrictive parental mediation strategies are the ability to protect the child from certain types of negative content, as well as online dating. Their limitations are determined by greater passivity and lower digital competence of the adolescents themselves, as well as the fact that they often hide their activity online from their parents and do not ask for their help. In addition, restriction and technical control strategies do not seem to help with regard to technical risks and fraud; adolescents whose parents use these strategies face these risks even more often than adolescents whose parents do not use them, but rarely tell their parents about them. The advantages of active mediation and security mediation are related to more open communication, when adolescents more often tell their parents about what happened online and ask for their help, are more willing to change privacy settings, and their limitations concern the greater risk of encountering negative content and online fraud.

Conclusions

Adolescents often do not pay much attention to parental bans and their parents actively taking part in their online activities, while their parents underestimate the risks (primarily regarding communication and content) encountered by their children. Meeting in person with online friends, hateful messages, sexual content, ways of inflicting physical harm, cyberaggression, ways of taking drugs and committing suicide are the most common online risks, and many of these are underestimated by parents. In regard to meeting in person with online friends, excessive financial costs, fraud and all types of negative content, older adolescents (14–17 years) fall into the risk group. Gender differences in encountering online risks are isolated and can be explained by the pattern of social requirements and images of men and women that are typical of Russian culture. The study shows that the decision of adolescents to look for help from their parents in regard to online difficulties depends not on the digital competence of their parents, but on the way their parents mediate: active support while using the Internet and attention to safety measures. On the one hand, parental active mediation and safety mediation are related to adolescents' greater willingness to share with their parents what happened online or take some measures (for example, to change privacy settings); on the other, they are more related to a higher probability of encountering online risks by adolescents, in particular negative content or online fraud. By comparison, restrictive mediation and technical control are less related to general online risks, but more related to technical risks and theft of personal information, which parents may not be aware of. Negative correlation between adolescents' digital competence and their parents' restrictive mediation and technical control allow us to suggest that excessive control and restrictions interfere with developing skills and expertise in exploring the Internet, including safe exploration.

Limitations

The limitations of this study are primarily in the characteristics of the sample. Only subjective estimates obtained in two different samples were used: parents and adolescents. Unlike studies performed on parent–child pairs, this does not reveal the sources of discrepancies in their assessments and perceptions. Respondents were residents of large cities. These sampling features may limit generalization of the results.

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Visuospatial Working Memory Development Across Years of Schooling

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Background. Visuospatial working memory changes across years of schooling. According to data from the cross-sectional and longitudinal studies available in the literature, conclusions about the linear or nonlinear nature of changes in visuospatial working memory depend on the period of time analyzed and the frequency of the measurements. However, which of the two nonlinear models of functional dependence (*e.g.*, quadratic or cubic) best describes the developmental trajectories of visuospatial memory across schooling is still an open question.

Objective. The results of statistical analysis of the development of visuospatial working memory in girls and boys across school years from Grade 1 to Grade 11 are presented. Additionally, the relationship between age and years of schooling is investigated, as is the influence of these factors on the developmental trajectory of visuospatial working memory.

Design. This cross-sectional study involved 1,246 pupils who were in Grades 1 to 11 at one public school; their ages ranged from 6.8 to 19.1 years (50.4% were boys). The students' visuospatial working memory was measured using the computerized "Sequences" test, which is based on the "Corsi block-tapping task" and has been adapted for Russian schoolchildren. Correlations, analysis of variance, and polynomial regression were carried out, and both linear and nonlinear models of the functional dependence of working memory on years of schooling were tested.

Results. The results of the multiple regression analysis suggest that the number of years of schooling is a more important factor than age with regard to temporal changes in visuospatial working memory. When we introduced "years of schooling" and "age" predictors into a single model, we found the years of schooling to be the most significant predictor of visuospatial working memory ($\beta = 1.07$; $p = 0.000$).While age remained a statistically significant predictor ($\beta = -0.52$; $p = 0.008$), it did not significantly improve the model characteristics (corrected $R^2 = 0.30$; $F(2) = 253.9$; $p < 0.01$).

Keywords:
visuospatial working memory; school education; grade; age; cross-sectional study; polynomial regression; gender differences

The results of the polynomial regression showed that during schooling, the developmental trajectories of visuospatial working memory are nonlinear for both genders. In girls, both the quadratic and cubic models explained 36% of the variance in visuospatial working memory, but the quadratic model had the least number of parameters and the best fit to data. In boys, despite all theoretical models being suitable, the largest percentage of the variance in visuospatial working memory values was explained using the cubic model ($R^2 = 0.31$; $p = 0.000$). Thus, the characteristic of change in visuospatial working memory for girls had a quadratic relationship that stabilized after Grade 8, while for boys, the relationship was cubic, with the period of stabilization between Grades 5 and 6, and then further growth.

Conclusion. We concluded that the number of years of study is an important factor in the development of visuospatial working memory during the schooling period, but that there are other factors involved as well.

Introduction

Working memory is the ability to temporarily store and process small pieces of information necessary for current thinking activities. According to one of the most developed concepts, working memory is a system consisting of a visuospatial matrix, a phonological loop, a central control element, and an episodic buffer that accumulates incoming information from different modalities (Baddeley & Hitch, 1994). In the context of educational problems, a special role in the working memory system is assigned to the visuospatial matrix, which is responsible for the storing and processing of spatial and visual information obtained in the process of direct perception or extracted from long-term memory (Tikhomirova & Malykh, 2017; Tikhomirova, 2017; Pagulayan et al., 2006, etc.).

Visuospatial working memory is measured by two types of tests. The first type measures static visuospatial working memory, which is related to the storage and reproduction of the spatial position of simultaneously presented stimuli (Roberts, 2016; Englund et al., 2014). The second type measures dynamic visuospatial working memory and consists of memorizing and reproducing sequentially represented stimuli (Pagulayan et al., 2006). This second type is often used to measure visuospatial working memory during school age, in particular, by the now-classic "Corsi block-tapping task" (Pagulayan et al., 2006). In this test, which has been adapted for Russian-speaking schoolchildren as "Sequences," rows of blocks that light up in a certain order are presented on a computer screen, and then the test subject must repeat the order in which they lit up for each row (the rows consist of four to nine blocks) (Tikhomirova & Malykh, 2017; Tosto et al., 2013).

The phenomenon of working memory is often studied in cross-sectional studies of schoolchildren when there is a single measurement taken for children in different years of schooling, with different levels of education, etc. Longitudinal studies of working memory are much less frequently carried out. The essence of these is multiple measurements of a trait in the same respondents over a period of time, such as during the period of primary education, compulsory general education, etc. The choice of method is determined by the objectives of the study, the size of the samples, and the time and administrative capacities of the researcher (see in more detail Tikhomirova, Kuzmina, & Malykh, 2020). Thus, when using the data obtained

at one point in time, the researcher is studying the specifics of change in a psychological trait over a certain period of time, such as, for example, the age features of each year of primary school education. The data collected in longitudinal studies make it possible to analyze the development of a trait over a certain period of time and to construct the trajectory of development during the whole schooling period.

Age and Years of Schooling in Changes in Visuospatial Working Memory

Both cross-sectional and longitudinal studies raise the problem of the relationship between student age and years of schooling, and their influence on the change in working memory. This problem is especially relevant for studies involving Russian schoolchildren and is associated with a wide range of age variability among children in each year of schooling. In one longitudinal study, the age differences between Russian students in first grade were as high as two years; and fourth-grade students' average ages varied from 9.72 to 11.85 years (Tikhomirova et al., 2019). Additionally, there are significant overlaps in student age between different years of schooling. For example, a cross-sectional study involving Russian students from six general education schools showed that children aged 11 could be found studying in both the third grade and the fifth grade (Tikhomirova & Malykh, 2017). This can be due to a whole range of reasons, but it is primarily because parents can request early (at approximately 6.5 years) or late (closer to 8 years) entry of their child into the first grade.

The effects of student age and the number of years of study on cognitive skills were examined by Cahan & Cohen (1989) using a sample of peer children who entered school at different ages — usually a year early or a year late. They showed that students who entered the fifth grade a year earlier than their peers, performed better on intelligence tests by the end of the school year (Cahan & Cohen, 1989). Moreover, this performance gap remained until the end of the eighth year of schooling, indicating the significance of the effect that years of study have on cognitive skills development.

Another study compared the effects of age and learning activity in a sample of older people (Longman, Saklofske, & Fung, 2007). Statistically significant correlations between time spent on lifelong learning and average cognitive test scores were reported in older age groups. For example, the average IQ value among Americans with eight years of education is 86 or less, while that of their peers with sixteen years of educational experience is 112 (Longman, Saklofske, & Fung, 2007). However, in studies of the influence of student age and years of schooling on temporal changes in psychological traits, both measures are still equally considered and are sometimes used synonymously (Tikhomirova, Kuzmina, & Malykh, 2020; Kuzmina et al., 2020; Schneeweis, Skirbekk, & Winter-Ebmer, 2014; Isbell et al., 2015).

Changes in Visuospatial Working Memory Across Lifespan

Working memory changes over time. This fact is observed in cross-sectional studies, which report an increase in average values (Tikhomirova et al., 2013; Roberts, 2016; Tikhomirova, 2017; Verbitskaya et al., 2015), and in longitudinal projects,

which calculate trajectories of development over a certain time interval (López-Vicente et al., 2016; Isbell et al., 2015).

According to studies dating back 25 years, changes in working memory are nonlinear: working memory improves intensively while one is in primary and secondary school, and it declines in old age (Siegel, 1994). In particular, a study of working memory covering a broad age range from 5 to 80 years showed a significant increase in working memory during childhood, with only 30-year-old respondents reaching peak values (Alloway & Alloway, 2013). Thus, the change in this cognitive parameter appeared to be related to the specificity of the stimulus material in the working memory tests: verbal or visuospatial stimuli.

A study involving groups of respondents ages 6–10, 14–17, and 18–25 years showed that the cubic relationship between age and working memory test scores, with a stabilization period at 15–20 years, best describes changes in dynamic visuospatial memory (Roberts, 2016). However, this study had limitations due to the lack of data from respondents ages 11 to 13 years, and the small number of participants in each age group (approximately 100), which may have led to some distortion of the results. The hypothesis of the nonlinearity of the development of visuospatial working memory was also supported in a large-scale study with four repeated measurements over a one-year period in children ages 7–11 years (López-Vicente et al., 2016). The most intensive growth was recorded during the period from 7 to 10 years, while after 11 years of age, working memory had stabilized.

By contrast, a number of studies have reported linear changes in working memory from early childhood to adolescence (Isbell et al., 2015; Goldstein et al., 2014; Thaler et al., 2013). For example, a study of working memory based on the model by A. Baddley and G. Hitch analyzed the dynamics of individual components of working memory in children ages 4 to 15 years (Gathercole et al., 2004). It was shown that the trajectory of changes in working memory rose linearly from 4 to 14 years of age, stabilized at the ages of 14 to 15 years, and then plateaued. More recently, a study showed a similar trend in the nature of working memory change in a sample of children starting at 6 years old (Goldstein et al., 2014).

These studies also reported an earlier age-specific stabilization of working memory development at ages 11–12 years, but they still supported the conclusion of a linear pattern of change (Thaler et al., 2013). These studies also discussed the limitation of the upper-age range of samples, which is 14–15 years, leaving open the question of the further developmental trajectory of working memory, and acknowledging that stabilization in adolescence may be an indirect confirmation of the nonlinearity of the age dynamics of working memory. The thesis about the continued growth of working memory after stabilization in adolescence was proven in a study with three dimensions and children of 13, 16 and 20 years old (Isbell et al., 2015).

In studies involving Russian schoolchildren, it has been shown that at different stages of basic general education, there is an increase in average visuospatial working memory as measured by the "Sequences" test (Tikhomirova et al., 2013; Verbitskaya et al., 2015; Tikhomirova, 2017). It has been shown, in particular, that in primary school, the number of years of study explains 9% of the variation in

visuospatial working memory values (Tikhomirova et al., 2015). It is emphasized that the increase in the average values of working memory test scores occurs at the expense of maximums. The minimums of working memory test scores actually remain unchanged during the period of primary school and during the basic level of general education (Tikhomirova & Malykh, 2017).

Thus, according to data from the cross-sectional and longitudinal studies available in the literature, conclusions about the linear or nonlinear nature of changes in visuospatial working memory depend on the period of time analyzed (up to 14, 25, or 80 years) and the frequency of measurements (only at 13, 16, and 20 years of age in the period from 13 to 20 years or at 7, 8, 9, and 10 years of age in the period from 7 to 10 years). Which of the two nonlinear models of functional dependence (*e.g.*, square or cubic) best describes the developmental trajectories of visuospatial memory is still an open question.

In this context, the most informative period is the period of school education, during which students actively master spatial activities, gain increased experience using computer technologies, and form geometric concepts. All of this promotes the intensive development of spatial abilities, including visuospatial working memory, making this cognitive trait plastic (Uttal et al., 2013; Jaušovec & Jaušovec, 2012). It is worth noting that boys' greater interest in and experience with spatial activities are often used as an explanatory category when analyzing gender differences in spatial abilities (Frenken et al., 2016).

Gender differences in visuospatial working memory
and their changes across lifespan

Gender differences in working memory are a common subject of cross-sectional studies that examine the periods of most intense growth and stabilization of mean working memory values in children, adolescents, youth, adults, and the elderly (Frenken et al., 2016). Several studies have reported the existence of gender differences in the development of visuospatial working memory in favor of both men and women (León, Cimadevilla, & Tascón, 2014; Bull, Davidson, & Nordmann, 2010; Wai, Lubinski, & Benbow, 2009; Voyer et al., 2007; Vuontela et al., 2003, etc.). Other studies have demonstrated similarities in the age dynamics of working memory test scores that include visuospatial stimuli (*e.g.,* Robert & Savoie, 2006).

It has been shown that in the period from 6 to 13 years of age, gender differences in performance on visuospatial working memory tests are most evident at 6 to 8 years of age, less evident at 9 to 10 years of age, and absent at 11 to 13 years of age (Vuontela et al., 2003). Throughout the analyzed age period, girls performed tasks better than boys with fewer errors. A slightly different result was obtained in the meta-analysis of 36 studies that included the following age groups: under 13, 13 to 18, and over 18 years of age (Voyer et al., 2007). For example, significant gender differences, favoring women, were found in age groups older than 13 years.

However, most studies have reported a male advantage in performance on visuospatial working memory tests (*e.g.*, Tikhomirova et al., 2015; Zilles et al., 2016; Frenken et al., 2016; Bull, Davidson, & Nordmann, 2010; Wai, Lubinski, & Benbow,

2009). For example, a statistically significant effect of the influence of gender, favoring boys, was obtained in samples of Russian high school students (Tikhomirova et al., 2013) and primary school students (Tikhomirova et al., 2015).

However, the advantage of each gender during the performance of visuospatial working memory tests can be related to the dynamics of change at certain ages. For example, in a longitudinal study of gender differences in working memory developmental trajectories, seven-year-old girls performed worse than their male peers, but during the course of the year, girls experienced more intensive growth, which resulted in higher visuospatial memory scores for girls at eight years of age (López-Vicente et al., 2016). The fact that there are gender differences in working memory, as with most cognitive traits, is explained in the context of biological (Zilles et al., 2016) and sociocultural (Frenken et al., 2016) paradigms.

Thus, the results of studies on gender differences in the developmental trajectory of visuospatial working memory show different and sometimes diametrically opposite results, which are due, among other things, to the shortness of the time intervals during which the working memory is analyzed (in particular, younger schoolchildren and adolescents ages 6–13 years, or only younger schoolchildren ages 7–11 years). Analyzing this psychological trait over a longer period of time, and covering different age periods, will make it possible to identify periods of growth, assess their intensity, and determine the stages of stabilization of the trait in both genders.

The Current Study

The current cross-sectional study aimed to analyze changes in visuospatial working memory in girls and boys throughout the whole schooling period, with measurements during each year — from the first to the eleventh grade. Expanding the period of schooling to include early school age, adolescence, and youth, increases the likelihood of understanding the influence of gender on changes in visuospatial working memory. In addition, this study investigated the problem of the relationship between student age and year of schooling, and analyzed their effects on temporal changes in working memory.

Methods

Participants

Our study involved 1,246 pupils in Grades 1–11 at one school; the pupils were ages 6.8 to 19.1 years (50.4% boys). There were 501 students in the primary school-age sample (Grades 1–4, primary level of general education; average age = 9.23 years; standard deviation = 1.12; 49.9% boys); 542 students in the secondary school-age sample (Grades 5–9, basic level; average age = 14.06 years; standard deviation = 1.56; 54.8% boys); and 203 students in the high school-age sample (Grades 10–11, full general education; mean age = 17.25 years; standard deviation = 0.68; 39.9% boys).

Table 1 provides a detailed description of the sample according to year of schooling (first to eleventh grades).

Procedure

To measure visuospatial working memory, we used the computerized "Sequences" test based on the "Corsi block-tapping task" (Pagulayan et al., 2006) adapted from studies involving Russian and British schoolchildren (Tikhomirova & Malykh, 2017; Tikhomirova, 2017; Tosto et al., 2013).

During the first stage of the tests, sets of blocks appear on the computer screen and light up one after another in a certain order; blocks light up in yellow for one second at intervals of one second. During the second stage, the "Start" command appears on the screen, and the participant must use the computer mouse to click on the blocks in the same order in which they lit up during the first stage.

The test begins with the test participant being presented with two sets (sequences) of 4 blocks. If the test participant fails to repeat both accurately, the test is automatically terminated. If the test participant repeats at least one of the sequences correctly, a sequence of increased difficulty is presented, with the number of blocks increased by one. The maximum number of blocks in a sequence is equal to 9. The test program records the number of correctly repeated sequences.

Written informed consent of parents and school administration representatives was obtained for the participation of the schoolchildren. The study was approved by the Ethics Committee of the Psychological Institute of the Russian Academy of Education (project identification code 2016/2–12). The data analysis was carried out on the basis of anonymized personal data.

Data collection was carried out in the computer science class strictly according to the developed protocols and under the supervision of the researcher. Each study participant executed the "Sequences" test on a personal computer with a 17-inch monitor, at a distance of 60 cm from the screen. More detailed information about the sample and procedure are available at Tikhomirova, Malykh, & Malykh, 2020; Verbitskaya et al., 2020.

Statistical Approach

At the first stage, the age variability of the participants in each year of schooling was analyzed. The correlation analysis between student age and years of schooling was carried out, and multiple regression analysis was conducted to determine the indicator of working memory, where the student age and years of schooling variables were used as predictors. Multiple regression allows the measurement of the contribution of student age and number of years of study to be included in the dispersion of the visuospatial working memory values.

At the second stage, descriptive visuospatial working memory statistics for girls and boys were calculated for each year of schooling. To assess the statistical significance of gender differences and measure the effect of gender on working memory in each year of schooling, a one-way analysis of variance was performed.

At the third stage, correlation analysis was carried out for samples of both genders in order to assess the relationship between year of schooling and visuospatial working memory.

During the fourth stage, polynomial regression was used to analyze age-related changes in visuospatial working memory; this allowed the testing of both linear and nonlinear (in particular, square and cubic) models of the functional dependence of the analyzed feature. Polynomial regression was performed on a general

sample, as well as on groups of girls and boys, to analyze gender differences in working memory changes during schooling. The least squares method was used to estimate the parameters of the regression equation.

Results and Discussion

Age and Year of Schooling, their Relationship, and the Effects on Working Memory Development

Table 1 shows age, gender, and sample sizes for each year of schooling.

Table 1

Description of Sample

Level of school education	Year of schooling	N	Average age (min – max)	N_{boys} (%)
Elementary	1	146	7.86 (6.8–7.8)	51.4
	2	117	8.85 (7.8–9.5)	49.6
	3	140	9.82 (8.8–10.9)	50.7
	4	98	10.85 (10.0–11.6)	46.9
Secondary	5	102	11.81 (10.8–13.0)	63.7
	6	98	12.81 (11.7–14.1)	59.2
	7	69	13.78 (12.8–15.1)	53.6
	8	101	14.81 (13.6–16.1)	59.4
	9	172	15.77 (14.2–18.0)	44.8
High	10	100	16.72 (15.3–17.0)	35.0
	11	103	17.77 (16.3–19.1)	44.7
Total	1–11	1246	12.64 (6.8–19.1)	50.4

As shown in *Table 1*, the average student age increases by one year every year–from 7.86 years in the first grade, to 17.77 in the eleventh grade. Thus, the difference in average age values from grade to grade is one year. Additionally, the wide range of age variability within one year of schooling warrants attention. For example, the difference in age between students in the sixth grade is almost three years, with a minimum of 11.7 years and a maximum of 14.1 years. In the ninth grade, the difference can be even greater: the average age is 15.77 years, but both 14-year-olds and 18-year-olds can be studying in the same grade. This wide variation is due to a number of reasons but primarily to the child's early or late entry into first grade at the request of parents (from 6.5 or 8.0 years of age), the need to reeducate a child with poor academic performance, or health problems, etc.

In addition, there are significant overlaps in ages between different years of schooling. For example, according to *Table 1*, a child aged 13 can be enrolled in the fifth, sixth, or seventh grade. Nevertheless, both student age and year of schooling can be simultaneously considered as predictors when analyzing changes in visuo-spatial working memory (Tikhomirova, Kuzmina, & Malykh, 2020; Kuzmina et al., 2020; Isbell et al., 2015).

The results of the correlation analysis between schoolchildren's ages and years of schooling showed a very high correlation (r = 0.993; $p < 0.01$). However, despite this high correlation coefficient, each of these factors may have a unique effect on cognitive development (see, for example, Schneeweis, Skirbekk, & Winter-Ebmer, 2014).

The multiple regression analysis, where age and year variables were used as predictors, allowed us to measure the contribution of each of these variables to the variation of visuospatial working memory. Thus, with the help of the "years of schooling" predictor, 30% of the dispersion of the working memory index was explained (model characteristics: corrected $R^2 = 0.30$; F = 498.2; $p < 0.01$), while with the help of the "age" predictor, only 28% was explained (model characteristics: corrected $R^2 = 0.28$; F = 467.5; $p < 0.01$). When the variables were introduced into one regression model, years of schooling were determined to be the most significant predictor of visuospatial memory ($\beta = 1.07$ at $p = 0.000$), while age, which remained a statistically significant predictor ($\beta = -0.52$ at $p = 0.008$), did not significantly improve the model characteristics (corrected $R^2 = 0.30$; F(2) = 253.9; $p < 0.01$).

This result suggests that number of years of study is a more important factor than age in changes in visuospatial memory, and this result is consistent with those from studies on the impact of education on cognitive development (Schneeweis, Skirbekk, & Winter-Ebmer, 2014; Nisbett et al., 2012; Longman, Saklofske, & Fung, 2007, etc.).

Further analysis will examine changes in visuospatial working memory in relation to years of schooling from the first grade to the eleventh grade.

Visuospatial Working Memory: Changes Across Schooling

Table 2 presents the average, minimum, and maximum scores of visuospatial working memory for girls and boys in each year of schooling.

Table 2

Descriptive statistics of visuospatial working memory

Level of school education	Year of schooling	Girls	Boys
Elementary	1	1.09 (0–5)	1.09 (0–4)
	2	1.85 (0–5)	1.77 (0–6)
	3	2.10 (0–6)	3.04 (0–7)
	4	2.75 (0–7)	3.87 (0–7)
Secondary	5	2.70 (0–6)	3.82 (0–8)
	6	3.97 (0–8)	3.84 (0–7)
	7	4.57 (0–9)	4.28 (0–9)
	8	5.10 (2–9)	4.79 (0–10)
	9	4.91 (0–9)	4.99 (0–11)
High	10	5.01 (0–8)	5.09 (0–9)
	11	5.10 (0–9)	5.20 (0–10)
Total	1–11	3.39 (0–9)	3.59 (0–11)

Table 2 presents the average values for the number of correct answers for the "Sequences" test, as well as minimums and maximums (in brackets) of the working memory index for girls and boys in each year of school education. The minimum and maximum values for the sequences test are 0 and 12, respectively.

According to *Table 2*, the dynamics of visuospatial memory growth are different for boys and girls during schooling, even as they have same starting values in the first grade (1.09). Boys have more intensive growth from the second to fourth years of schooling, while girls have more intensive growth from the fifth to eighth years. However, by the end of basic general education (ninth grade) and full general education (eleventh grade), the rates of growth for both genders are almost identical (for example, 4.91 for girls and 4.99 for boys in the ninth grade).

The analysis of variance reveals statistically significant gender differences in working memory only in the third (effect size of 9% of variance), fourth (10%), and fifth (5%) years of schooling ($p < 0.01$). The best performance on the "Sequences" test was observed in boys in the third to fifth years of schooling (see average values in *Table 2*). These results are fully consistent with the available literature on the male advantage in spatial abilities, including visuospatial working memory (Tikhomirova, 2017; Frenken et al., 2016; Bull, Davidson, & Nordmann, 2010; Wai, Lubinski, & Benbow, 2009).

According to the result of the analysis of variance, interaction between sex and year of schooling in the total sample was statistically significant ($p < 0.05$), indicating that there are the differences in visuospatial working memory between boys and girls across all schooling.

Results of the analysis of working memory in boys and girls showed that, in general, boys demonstrated a wider range of scores — from 0 to 11 of the maximum possible 12 points on the sequences test. This fact is often used as an explanation for the existence of gender differences in spatial abilities and the gender gap in high-tech industries that favor men (Wai, Lubinski, & Benbow, 2009; Zilles et al., 2016).

Correlation analysis between the years of schooling and working memory test scores was performed on the total sample, and in samples of boys and girls. The results showed the Spearman's correlation coefficient for the total sample of school-children to be 0.55 ($p < 0.01$), indicating a noticeable relationship between years of schooling and visuospatial working memory. Additionally, gender differences in these relationships were found. Thus, a slightly higher correlation coefficient (r = 0.60 at $p < 0.01$) was obtained in a sample of girls compared to boys (r = 0.51 at $p < 0.01$), which points to differences in their patterns of the development of working memory during the schooling period.

According to several studies, the development of working memory is characterized by intensive growth in the period from 6 to 14 years of age (according to Thaler et al. (2013), up to 11–12 years old), stabilization at the age of 11–15 years (Goldstein et al., 2014), and another period of growth with a peak at 30 years (Isbell et al., 2015; Alloway & Alloway, 2013). In other words, throughout the entire period of schooling — from 6.5 to 19 years of age — the development of visuospatial working memory follows a nonlinear trajectory.

Polynomial regression was used to determine the linearity or nonlinearity of the development of visuospatial working memory. In the course of analysis, both

linear and nonlinear (in particular, quadratic and cubic) models of functional dependence of working memory on the school year were tested.

Table 3 presents the results of the polynomial regression analysis, where the number of correct responses on the "Sequences" in the visuospatial working memory test was used as a dependent variable. In the course of the analysis, linear, square, and cubic dependencies of the working memory on the year of schooling were estimated.

Polynomial regression was carried out sequentially on the general sample of all schoolchildren (T), on the sample of girls (F), and on the sample of boys (M). The method of least squares was used to estimate the parameters of the regression equation.

Table 3

Results of polynomial regression on visuospatial working memory test scores

| Relationship		Model Summary					Parameter Estimates			
		R^2	F	df1	df2	p	Const.	b1	b2	b3
Linear	T	0.29	498.3	1	1168	0.000	1.030	0.39		
	F	0.34	307.4	1	578	0.000	1.024	0.39		
	M	0.25	205.7	1	588	0.000	1.500	0.37		
Quadratic	T	0.32	277.9	2	1167	0.000	0.294	0.86	−0.04	
	F	0.36	164.4	2	577	0.000	0.228	0.79	−0.03	
	M	0.29	119.8	2	587	0.000	0.392	0.90	−0.05	
Cubic	T	0.32	185.2	3	1166	0.000	0.210	0.93	−0.06	0.01
	F	0.36	110.8	3	576	0.000	0.732	0.37	0.05	−0.01
	M	0.31	81.5	3	586	0.000	−0.253	1.45	−0.16	0.01

According to *Table 3*, all analyzed theoretical models — linear, quadratic, and cubic — fit the empirical data well for the general sample of schoolchildren. The linear model showed directly proportional growth of visuospatial working memory during school education and explained 29% of the variation of this cognitive index ($p = 0.000$). The higher percentage of dispersion in the working memory test scores was explained by using nonlinear models: R^2 for both square and cubic dependencies was 0.32 at $p = 0.000$. However, the quadratic model had a smaller number of parameters, which to some extent indicated better correspondence with the empirical data.

In the sample of girls, all of the analyzed theoretical models also fit the empirical data well. Thus, 34% of the dispersion in the working memory test scores was explained using a linear model ($p = 0.000$). A larger percentage of the dispersion in the analyzed variable was explained in the framework of nonlinear models — quadratic and cubic (for both models $R^2 = 0.36$ at $p = 0.000$). However, when comparing the number of parameters, the quadratic dependence model better described the data.

In the sample of boys, despite all theoretical models being suitable, the largest percentage of dispersion of working memory values was explained using the cubic model (R^2 = 0.31 at p = 0.000). Twenty-five percent and 29% of the dispersion of working memory in boys was explained in terms of the linear and quadratic models, respectively.

Thus, during the period of schooling for both girls and boys, the change in visuospatial working memory was nonlinear. However, the change in working memory in girls was best described with a quadratic relationship, and in boys, it was best described with a cubic relationship. To be more precise, for girls, a gradual increase in the average values of working memory from the first to the fifth year of school was observed, followed by more intensive growth from the fifth to eighth grades and from the eighth to eleventh years, with stabilization occurring with a slight decrease in grades 9–10. This trajectory was best described by a graph of quadratic function — a parabola.

Boys of school age presented a different picture with regard to changes in working memory. According to the results of the analysis, working memory improved intensely from the second to the fourth year of schooling; in the 5th to 6th grades, the growth stabilized; and from the seventh to the eleventh year, working memory improved again, but this improvement was not as intense as it was at the beginning of the schooling period. This pattern of change fit the cubic parabola well. The identified gender differences in the developmental trajectories of visuospatial working memory are presented in *Figure 1* (1a for girls and 1b for boys).

1a – Girls   1b – Boys
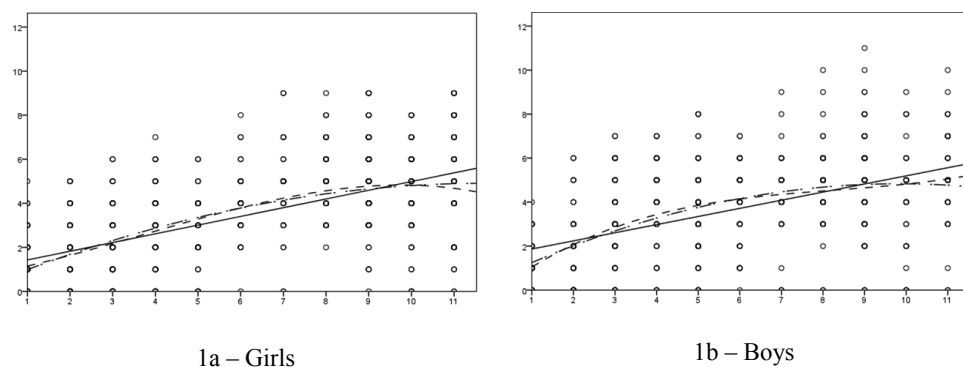
Figure 1. Dependence of visuospatial working memory on years of schooling

In *Figure 1*, the X-axis corresponds to the school year — from the first to eleventh grade (1–11); the Y-axis corresponds to the number of correct answers on the "Sequences" test (0–12). The linear function is indicated with a solid line, the quadratic function is indicated with a dashed line, and the cubic function is indicated with a dash-dot line.

As seen in *Figure 1*, the graphs of the quadratic function for girls and the cubic function in boys describe the observed measures of visuospatial working memory more accurately than the linear graphs. Confirmation of the nonlinearity of the development of working memory throughout the entire period of schooling observed in this study aligns with the data on the pronounced cubic relationship between

student age and test scores on the spatial memory sequences test in the period from 5 to 25 years (Roberts, 2016).

A study which set the upper limit of the age range of respondents of both genders at 14 years reported a linear improvement in working memory up to 11–12 years and further stabilization (Goldstein et al., 2014; Thaler et al., 2013). This result points to nonlinear dynamics in working memory development. These data are fully consistent with the results obtained in this study with the sample of boys: intensive growth with stabilization in the 5th and 6th grades (this corresponds to the ages of 11–12 years), and improvement in working memory from the 7th to 11th grades (ages 13.8 to 17.8 years).

Different results were observed in the girls' sample, with improvement in working memory observed up to the 8th grade (average age 14.8 years), and then stabilization that continued until the 11th grade (14.8 to 17.8 years old). These results echo the results of a study of the trajectories of the development of working memory in children up to the age of 15, which reported stabilization in boys and girls ages 14–15 years (Gathercole et al., 2004). The specifics of the development of visuospatial working memory in girls and boys presented in this work can to some extent explain the differences reported by existing studies, with regard to the beginning of the stabilization period in samples that included both genders (Goldstein et al., 2014; Thaler et al., 2013; Gathercole et al., 2004).

The results of polynomial regression on the sample of girls, using the number of years of schooling, found a slightly larger percentage of the dispersion of visuospatial working memory compared to that observed for boys. Thus, in the framework of both linear and nonlinear models for girls, the multiple determination coefficient R^2 varied between 0.34 and 0.36, while in boys it was between 0.25 and 0.31 ($p = 0.000$). These data confirm a stronger dependence of the development of working memory on years of schooling in girls than in boys, confirming the data on the relationship between behavioral level and gender specificity with regard to neurophysiological maturation, including differences in the degree of right-hand activation of Broca's zone (Zilles et al., 2016).

Conclusion

In this cross-sectional study, we studied the development of visuospatial working memory of girls and boys throughout their whole schooling period, taking measurements during each year from the first to eleventh grades.

A large sample of 1,246 schoolchildren, ages 6.8 to 19.1 years, showed a wide range of student age variability within one year of schooling — the age difference among students of the same grade could be up to three years. Significant overlaps in student age between different years of schooling were also observed; for example, children aged 13 years could be studying in the fifth grade or in the sixth or even seventh grade. This made the study of the relationship between student age and years of schooling and their effects on the development of working memory particularly relevant.

Despite the high correlation between age and number of years of schooling, each of these indicators had a unique effect on cognitive development. Indeed, the results of the multiple regression analysis, in which the variables of age and years

of schooling were used as predictors, indicated that the number of years of study was a more significant factor than age in the development of visuospatial working memory.

Polynomial regression showed that changes in visuospatial working memory were nonlinear during schooling for both girls and boys. The nature of change in working memory in girls resembled a quadratic relationship, with intensive growth from the fifth to the eighth year of education that stabilized after the eighth grade, whereas in boys, it resembled a cubic relationship, with intensive growth in the period from the second to the fourth year of education, stabilization between the fifth and sixth years, and then further growth.

According to the results of polynomial regression, 29 to 32% of the variation in visuospatial working memory was explained in the total sample of schoolchildren within the framework of linear and nonlinear regression. This result suggests that years of schooling, despite being important in the development of working memory during the schooling period, are not the only factor that affects the development of visuospatial working memory.

Limitations

This study has a number of strengths, including well-validated measurement of visuospatial working memory in a relatively large sample (N > 1,200). At the same time, the study has limitations since it omitted important factors (such as the SES of participants' families), which can affect the results. Unfortunately, these characteristics are not available for this sample and cannot be used in analysis.

Further directions for research include longitudinal studies, which could make it possible to understand the age-related factors that influence changes in visuospatial working memory, and to calculate the individual trajectories of the development of this cognitive trait in both boys and girls during the whole schooling period.

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