

**BIG 5 personality factors in relation to coping with contact restrictions during the  
COVID-19 pandemic: An explorative analysis**

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**Short Title**

Big 5 and Corona Pandemic

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**Author Note**

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### **Abstract**

The spread of the Sars-Cov-2 virus quickly developed into a pandemic. To slow down the spread of the resulting deadly disease COVID-19, many countries have severely restricted public and social life. In addition to the physical threat posed by the viral disease, such a pandemic has an impact on the mental well-being of individuals. In the present study we have therefore examined exploratively how individual differences based on the Big Five personality factors affect how people cope with contact restrictions during three weeks in the first wave of the COVID-19 pandemic in Germany. Using a small sample ( $N = 51$ ), we were able to show that extraverts in particular suffer from severe limitations and benefit from relaxation. Individuals with high neuroticism, on the other hand, have not shown any change in dealing with the restrictions over time, whereas conscientious individuals seem to experience no discomfort and even positive aspects in the time of social restrictions. This bolsters the concept of neuroticism as a vulnerability factor concerning mental well-being per se, but also shows the importance of the social context to allow protective factors like extraversion to take action.

**Keywords:** COVID-19, social distancing, Big Five, positive affect, negative affect

### Introduction

The novel coronavirus (Sars-Cov-2) has spread rapidly in China and many other countries around the world, leading to a pandemic. The disease caused by the virus is called COVID-19 and leads to the outbreak of acute infectious pneumonia (Bao, Sun, Meng, Shi, & Lu, 2020), which has already taken the lives of many people. Besides the obvious physical health hazard posed by the virus, the psychological consequences of such a pandemic and the resulting restrictions are immense. In this context, reports have already been published in China that the pandemic can have a major impact on the severity of existing psychiatric symptoms and also increases the risk of mental health problems (e.g., Chen et al., 2020; Yang et al., 2020). However, there are currently no studies available that address non-clinical personality factors such as the Big Five and their relationship to affect and the coping with the contact restrictions during the Covid-19 pandemic in Germany. While virtual social contact was of course possible during the pandemic, the term "social distancing" has become established as a description of the contact restrictions.

The Big Five model (for reviews, see John & Srivastava, 1999; McCrae & Costa, 2008) assumes that individual differences in personality can be adequately described by five factors. The model contains the traits openness, conscientiousness, extraversion, agreeableness, and neuroticism, and has been established psycho-lexically (De Raad, 2000) and with psychometric approaches using factor analytical methods (for review, see O'Connor, 2002). With regard to coping with the contact restrictions during the COVID-19 pandemic, extraversion and neuroticism might be especially relevant traits. Individuals with high neuroticism tend to be anxious and insecure (Barrick, Mount, & Judge, 2001), which leaves them vulnerable to psychological distress (Costa & McCrae, 1992). Moreover, neuroticism is associated with a negative response to stressors in the environment (Costa & McCrae, 1980) and an avoidant coping style (e.g., Bolger, 1990; Parkes, 1986). In this respect, neuroticism is related to both lower subjective well-being (Diener, Suh, Lucas, & Smith, 1999) and higher negative affect (Watson, Clark, & Tellegen, 1988). Especially in the context of the threat of a pandemic viral disease, individuals with high neuroticism are likely to exhibit stress, which is also reflected in coping with the contact restrictions.

In contrast, extraverts are considered social and gregarious individuals (Barrick et al., 2001), whose nature is additionally characterized by a striving for activity and stimulation (Costa & McCrae, 1992). Extraversion is also positively correlated with well-being (Diener et al., 1999), positive affect (Lucas, Le, & Dyrenforth, 2008; Watson & Clark, 1997; Watson et al., 1988), and positive mental health (Lamers, Westerhof, Kovács, & Bohlmeijer, 2012). While extraverts are prone to problem-focused coping (Amirkhan, Risinger, & Swickert, 1995; Penley & Tomaka, 2002), they also need more social support and seek help when being confronted with a stressor (Amirkhan et al., 1995). According to Swickert, Rosentreter, Hittner, and Mushrush (2002), the extravert's perception of the availability of social support was responsible for balancing the relationship between extraversion and negative stress effects. The latter aspect is particularly important, considering that during the social distancing regulations physical social support for the coping with the Covid-19 pandemic is not available.

Since dealing with contact restrictions is also strongly associated with adherence to rules, it is also conceivable that conscientiousness has a positive effect on social distancing, since conscientious people are characterized by their rule-abiding and self-disciplined nature (Barrick et al., 2001; Costa & McCrae, 1992). For openness to experience, which is characterized by curiosity and broad-mindedness (Barrick et al., 2001), and agreeableness, which is characterized by supportive and cooperative qualities (Barrick et al., 2001), we rather do not expect any direct influence on the coping with contact restrictions. Since we aim at the personal coping with the restrictions, a supportive attitude should not necessarily be reflected in the subjective perception of the situation.

In summary, the different traits and their relationship to a mood-dependent response to the corona-related changes and their value as a protective or vulnerability factor concerning mental discomfort or even disease, neuroticism is a vulnerability factor in relation to negative mood and also mental illness, especially those associated with negative mood, such as depression and anxiety disorders. Extraversion is normally considered a protective factor and linked to positive affect, but the specific situation of the social isolation in the corona crisis may have led to a different influence of the trait on mood, leading rather to a decrease in positive affect or rise of negative affect if the social interaction is not given. As the isolation or “social distancing” was applied with a transparent set of

rules, conscientiousness could instead be a protective factor in this case, as the following of the rules may not only provide great health, but also lead to the satisfaction of “doing the things right and as they ought to be”, which might lead to higher well-being in persons with high trait conscientiousness.

Based on the character traits of the relevant Big Five personality factors, we have derived the following hypotheses.

*H1:* Extraverts have difficulties in coping with the restrictions, especially at the first time of measurement, when contact was still very limited. We attribute this to the limitation of the extraverts' nature by the official regulation during the COVID-19 pandemic. This correlation is assumed to decrease over time, which is additionally visible in a positive correlation to positive affect at the second and third measurement.

*H2:* Regardless of the relaxation of restrictions, individuals with high neuroticism consistently show poor coping, as the overall situation remains threatening to them. This is also reflected in a positive correlation with negative affect.

*H3:* High conscientiousness correlates positively with the coping of contact restrictions, since rule-oriented behavior fulfills a positive self-purpose for this group of individuals.

## Method

### Participants

For the purpose of this study, we collected data via the SoSci Survey online-questionnaire-portal (Leiner, 2020). At the first of three measurements (details below) 51 individuals ( $M_{\text{age}} = 25.88$ ,  $SD_{\text{age}} = 9.91$ , 92% female) participated, but only 36 of these participated at the second ( $M_{\text{age}} = 25.28$ ,  $SD_{\text{age}} = 10.8$ , 97% female) and 32 at the third measurement ( $M_{\text{age}} = 25.31$ ,  $SD_{\text{age}} = 11.33$ , 97% female). Participants were recruited via postings and consisted of students of psychology of the University of Würzburg, students of other disciplines as well as non-students.

**Procedure**

The participants completed a short online survey once a week for three consecutive weeks. Since the study was conducted in Germany, the dates of measurement are based on the respective regulations. The first measurement date (T0) was in calendar week 18, when strict restrictions still existed in Bavaria. It was allowed to meet outside with a contact person from another household. The second measurement date (T1) was in calendar week 19, from which on it was permitted to visit the close family in addition to a contact person outside the household. In the course of this week, it was also permitted that the residents of two households visit each other privately. In the last period (T2), calendar week 20, no explicit changes were made regarding the contact restrictions, although shops, for example, have reopened regardless of their size (wearing a mask is required).

**Rating instruments**

At T0, we asked for standard demographic data, whether the person belongs to the corona risk group (8%) and whether a corona test had already been made (0%). In addition, the following questionnaires were collected at each of the three measurement dates (T0, T1, and T2). We have selected the Big Five Inventory-SOEP (BFI-S; Schupp & Gerlitz, 2008) to measure the Big Five personality factors in an economic way, as it includes 3 items per factor on a 7-point likert scale. For the assessment of positive and negative affect, we used the Positive and Negative Affect Schedule (PANAS; Breyer & Bluemke, 2016) with 20 items on a 5-point likert scale. As we wanted to record temporary and current affects, we asked the participants how they feel with regard to the current situation. To identify the coping regarding social restrictions during the COVID-19 pandemic, we generated 20 new items like "I am satisfied with the current restriction of social contacts" or "I miss going to parties and festivities" (reverse coded) using a 7-point likert scale. For descriptive statistics of the questionnaire data and reliabilities, see Table 1.

**Table 1**

Reliabilities (Rel; Cronbach's  $\alpha$ ), means ( $M$ ) and standard deviations ( $SD$ ) for the corona restrictions coping questions, BIG 5 factors (extraversion, neuroticism, conscientiousness), and affect (positive, negative) regarding the three measurements (T0, T1, and T2).

	T0 ( $N = 51$ )			T1 ( $N = 36$ )			T2 ( $N = 32$ )		
	Rel	$M$	$SD$	Rel	$M$	$SD$	Rel	$M$	$SD$
corona coping	.85	4.65	.79	.89	4.65	.85	.86	4.66	.83
extraversion	.79	4.44	1.13	.69	4.35	.80	.84	4.52	.99
neuroticism	.80	4.29	1.25	.67	4.28	1.14	.82	4.45	1.23
conscientiousness	.58	5.26	.95	.72	5.33	1.03	.72	5.58	.94
positive affect	.83	2.92	.64	.85	3.07	.56	.80	3.12	.53
negative affect	.83	1.58	.50	.80	1.47	.43	.86	1.48	.48

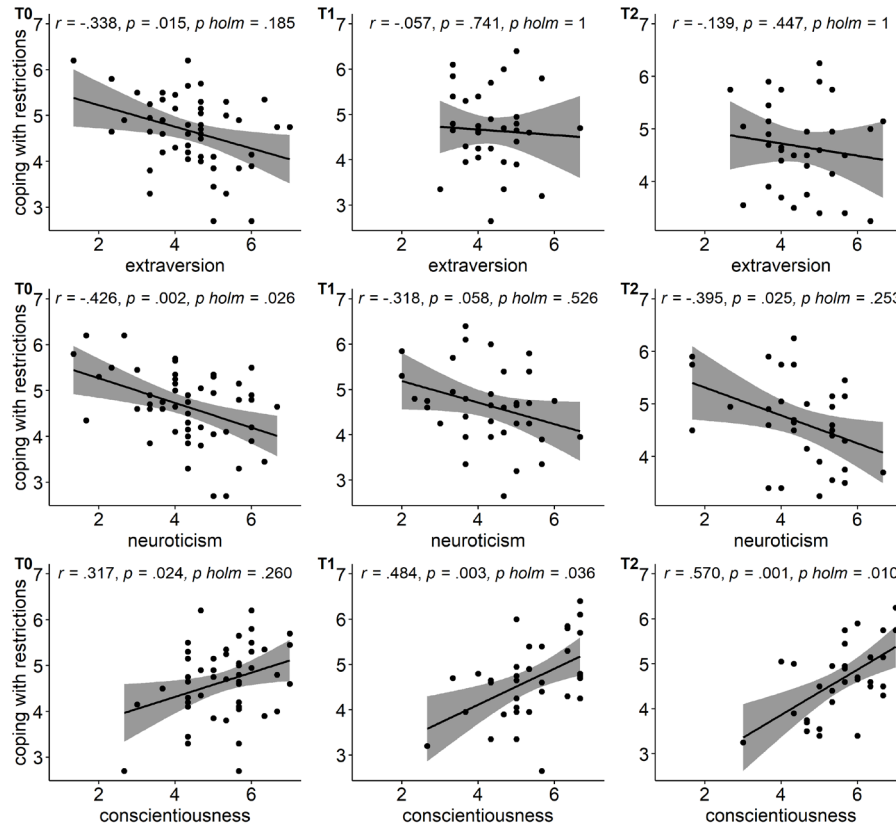
### Results

At T0, extraversion correlated negatively with the coping with the contact restrictions ( $r = -.338, p = .015$ ), as illustrated in Figure 1<sup>1</sup>. Over the course of time, at T1 and T2, this correlation is still negative but considerably weaker ( $r_{T1} = -.057$ , and  $r_{T2} = -.139$ ) and not significant ( $ps \geq .447$ ). To test for differences between the three measurements we compared the correlations coefficients according to Eid, Gollwitzer, and Schmitt (2011). As a result, the correlation between extraversion and the coping decreased significantly from T0 to T1 and from T0 to T2 (all values of  $p \leq .018$ ). Moreover, neuroticism correlated negatively with the coping with the contact restrictions across all three measurements (all values of  $r \leq -.318$ , all values of  $p \leq .058$ ) and with no differences between the coefficients (all values of  $p \geq .108$ ). In contrast, conscientiousness correlated positively with the coping with the contact restrictions across all three measurements (all values of  $r \geq .317$ , all values of  $p \leq .024$ ). The correlation coefficients increased significantly from T0 to T1 ( $p = .025$ ), and from T0 to T2 ( $p = .001$ ).

<sup>1</sup> As this is foremost an exploratory study of a unique event, we chose to report the unadjusted  $p$ -values here. In the figures 1-3, we have additionally included  $p$ -values according to Bonferroni-Holm adjustment.

**Figure 1**

Correlations between extraversion, neuroticism, conscientiousness, and the questionnaire regarding the coping with the contact restrictions during the corona pandemic. T0, T1, and T2 indicate the times of measurement and the shaded areas represent the 95% CI.

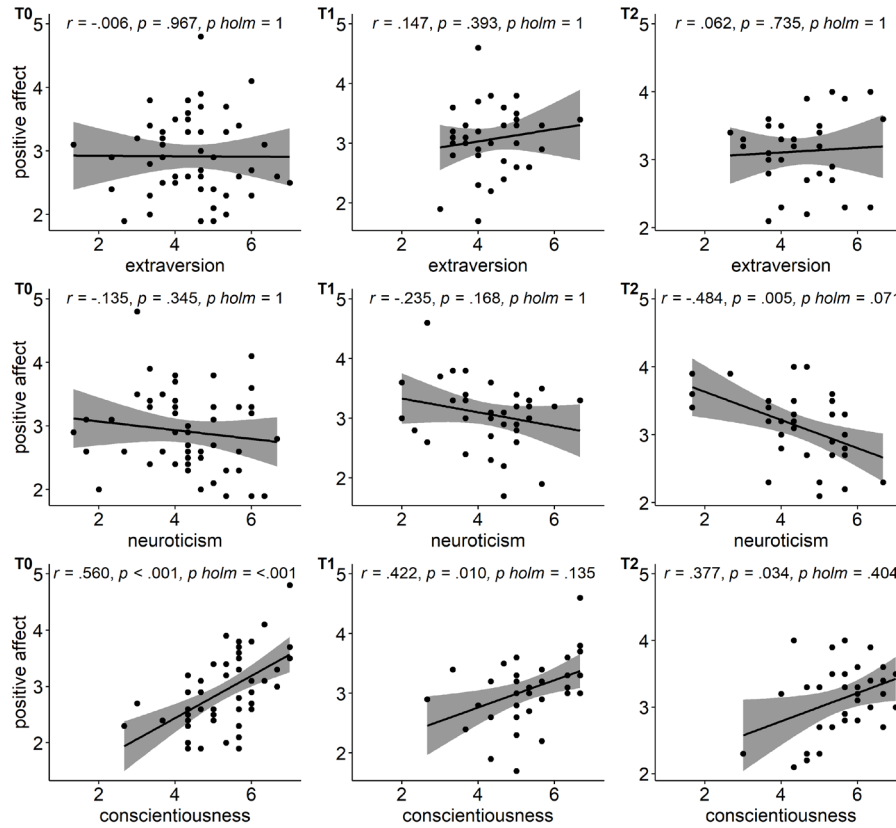


In terms of positive affect (see Figure 2), we could not find a significant correlation with extraversion (all values of  $r \leq .147$ , all values of  $p \geq .393$ ). However, between T0 and T1, T1 and T2, and T0 and T2 we could not detect significant differences of the correlation coefficients (all values of  $p \geq .165$ ). While for neuroticism only T2 was significantly negatively correlated with positive affect ( $r = -.484, p = .005$ ), for conscientiousness all three measurements were positively correlated (all values of  $r \geq .377$ , all values of  $p \leq .034$ ). Comparing correlation coefficients revealed that for individuals with high neuroticism the positive affect even decreased from T0 to T2 ( $p = .007$ ). In contrast, conscientious individuals showed a trend for an increase in positive affect from T0 to T2 ( $p = .067$ ).



**Figure 2**

Correlations between extraversion, neuroticism, conscientiousness, and positive affect (PANAS) during the corona pandemic. T0, T1, and T2 indicate the times of measurement. Shaded areas represent the 95% CI.

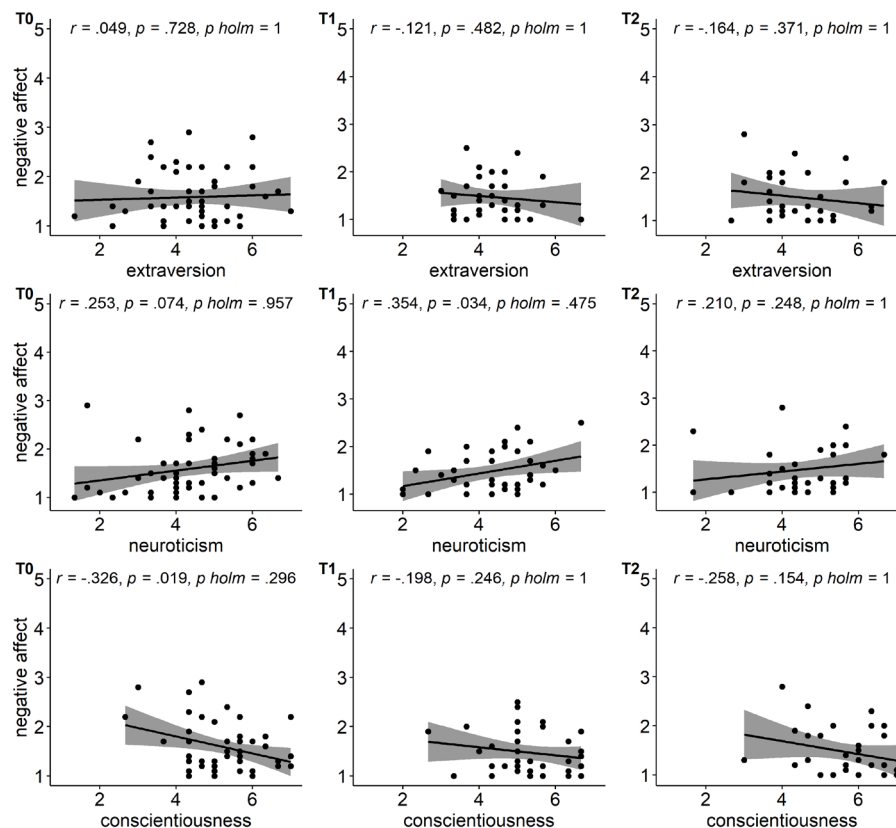


For negative affect (see Figure 3), we found no correlation with extraversion (all absolute values of  $r \leq .164$ , all values of  $p \geq .371$ ) and no significant difference between the three timepoints (all values of  $p \geq .140$ ). Neuroticism was positively correlated with negative affect only at T1 ( $r = .354$ ,  $p = .034$ ), whereas conscientiousness was negatively correlated with negative affect at T0 ( $r = -.326$ ,  $p = .019$ ). Both neuroticism and conscientiousness did not show a significant difference in their correlation coefficients across the timepoints (all values of  $p \geq .199$ ).

Considering openness and agreeableness, we could not find any significant correlations to coping with corona contact restrictions (all absolute values of  $r \leq .140$ , all values of  $p \geq .326$ ), as well as to positive (all absolute values of  $r \leq .289$ , all values of  $p \geq .088$ ), and negative affect (all absolute values of  $r \leq .297$ , all values of  $p \geq .079$ ).

**Figure 3**

Correlations between extraversion, neuroticism, conscientiousness, and negative affect (PANAS) during the corona pandemic. T0, T1, and T2 indicate the times of measurement. Shaded areas represent the 95% CI.



### Discussion

We have investigated how the Big Five personality factors are related to the coping with contact restrictions and the perception of positive and negative affect during the COVID-19 pandemic. For this purpose, we tested over three measurement periods during which restrictions were reduced.

As hypothesized, we demonstrated that extraverted individuals have a poorer coping with contact restrictions, especially at the time when they were quite strict. Although not positively correlated, this correlation is diminishing as the restrictions are relaxed. Consequently, the restriction of social contacts from external sources (i.e., the government) seems to be a challenge for extraverts, as they were limited in their natural characteristics like sociality and talkativeness (Barrick et al., 2001). Once they were allowed to visit their family and friends again, the severity of the impact decreases relatively quickly. However, contrary to our assumptions, we were not able to show that the facilitation of contact regulations was also reflected in the positive affect among extraverted

individuals. The missing effect indicates how strongly extraverts are dependent on a well-functioning social life. This coincides with the findings of Lee, Dean, and Jung (2008), who reported that the connection between extraversion and well-being is mediated by social connectedness. Hence, it is vital to be aware of the situational interaction of the traits with the given social setting and that massive changes in society, such as those brought up in a crisis, not only influence the direct outcome of the infections in a desirable way, but that some protective factors for other illnesses (such as depression or anxiety disorders) may also be influenced in an undesirable way. A massive global restriction of social interaction such as the corona intervention through contact bans has not been applied for decades and the impact on social and individual health are a complex interaction. Therefore, one may also take into account that protective factors, which used to prevent mental illnesses like depression and anxiety disorders, are no longer in place and thus, a different support structure for persons at risk as well as a redefinition of the “patient profiling” (e.g., Delgadillo, Moreea, & Lutz, 2016) might be appropriate.

Among individuals with high neuroticism, we were able to demonstrate that the relaxation of restrictions has no substantial impact on coping, as the correlations were negative and not different from each other across the three weeks. Since the easing of protective regulations does not mean that the pandemic is over, this effect was anticipated and hypothesized due to the anxious nature of neuroticism (Barrick et al., 2001; Costa & McCrae, 1980). This also coincides with the correlations regarding affect. While at the first two measurements individuals with high neuroticism evaluate the negative affect as stronger as individuals with low neuroticism, this correlation decreases at the last measurement. However, at the last measurement the correlation between neuroticism and positive affect is largely negative, which indicates that the affective evaluation shifted from a rather negative perception to a lower positive perception. Overall, this fits very well with the findings that neuroticism is associated with a lower perceived coping ability and increased negative emotions (Penley & Tomaka, 2002). The correlation in the affective states also coincide with findings on individuals with high neuroticism, especially in relation to their emotion-centered coping strategies (e.g., O'Brien & DeLongis, 1996).

With respect to conscientiousness, we were able to show that high values are accompanied by a good coping independent of external events. According to Penley and Tomaka (2002), conscientious

people perceived themselves as able to meet situational demands, which has a positive effect on the compliance and handling of contact restrictions during the pandemic. Moreover, conscientious people show a strong positive effect at all measurement dates and a negative effect only at the first measurement date. This also fits with findings that have associated conscientiousness with emotions related to attentiveness, a facet of positive affect (Watson, 2000; Watson & Clark, 1992). Thus, conscientiousness may be a protective factor for mental illness in these times of historic restriction in social interaction, since the positive affect of adhering to the outlined rules protects not only from a virological point of view, but is also linked to recovery from depression and anxiety (Javaras et al., 2012). These days, this can also be taken into consideration in outpatient interventions for the aforementioned mental illnesses, as the structure that can be determined by the therapists could also help to create more well-being among these participants, and this might be of greater importance than in the normal therapy settings before.

Finally, we want to address possible limitations. A larger sample could also allow for revealing smaller effects and, for example, investigate mediating effects of personality traits. Moreover, most of the respondents were female, which greatly limits the generalizability of the results. An additional limitation is the restricted sample of Germans that we assessed. As the lockdown was relatively short and the casualties of the pandemic were minor compared to other states, this might also lead to dampened effects. Since this is an exploratory study with a small sample size, we refrained from using complex models or moderation analyses, which would also be of great interest if a larger sample size would be available. However, as we have experienced a unique event with this lockdown, we are still confident that the data may offer insight into the relation between trait and coping behavior yet being only a small sample and exploratory in nature.

Possible practical implications of the results of this study could arise in terms of psychological support if contact restrictions reappear in the context of another wave of the pandemic. Particularly in the case of extraverted persons, the focus could lie on self-centered coping strategies to maintain personal well-being.

In conclusion, we could demonstrate that extraverts suffer from severe contact restrictions during the COVID-19 pandemic and partly benefit from the stepwise relaxation of these restrictions. However, the full protective function of extraversion concerning mental illnesses that is indicated by a positive link to positive mood has not recovered in this phase of the pandemic. This underlines the importance of social connectedness for these individuals and the complex impact of this global intervention of contact restrictions that were necessary as COVID-19 intervention. In contrast, neuroticism is still constantly a vulnerability factor as individuals with high neuroticism are coping rather poorly with the pandemic situation, while conscientious persons are coping well, maybe due to their tendency to enjoy following rules and provided structure and therefore create a predictable behavioral outcome even in an unpredictable and uncertain world and times like these.

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The authors have no funding to disclose.

### **Compliance with Ethical Standards**

All procedures performed in studies involving human participants were in accordance with the ethical standards of the ethics committee of the University of Würzburg (GZEK 2020-25) and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

### **Conflicts of Interest**

The authors declare they have no conflict of interest.

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