

# Personality and Pandemic: The Influence of Big Five Traits on Coping with COVID-19 Contact Restrictions in a Small Sample

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*To slow down the spread of the SARS-Cov-2 virus, countries worldwide severely restricted public and social life. In addition to the physical threat posed by the viral disease (COVID-19), the pandemic also has implications for psychological well-being. Using a small sample (N = 51), we examined how Big Five personality traits relate to coping with contact restrictions during three consecutive weeks in the first wave of the COVID-19 pandemic in Germany. We showed that extraversion was associated with suffering from severe contact restrictions and with benefiting from their relaxation. Individuals with high neuroticism did not show a change in their relatively poor coping with the restrictions over time, whereas conscientious individuals seemed to experience no discomfort and even positive feelings during the period of contact restrictions. Our results support the assumption that neuroticism is a vulnerability factor in relation to psychological wellbeing but also show an influence of contact restrictions on extraverted individuals.*

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**Keywords:** Big Five; Coping; COVID-19; Positive Affect; Negative Affect

## INTRODUCTION

The coronavirus (SARS-Cov-2) has spread rapidly worldwide, leading to a pandemic beginning in 2020. The disease caused by the virus (COVID-19) led to the outbreak of acute infectious pneumonia (Bao et al. 2020), which has already cost many lives. Beyond the physical health hazard, the psychological consequences of such a pandemic and the resulting contact restrictions are immense. The pandemic has had a major impact on the severity of existing psychiatric symptoms and has increased the risk of mental health problems (Serafini et al. 2020; Weiß et al. 2022). Coping refers to the thoughts and actions that individuals use to deal with such stressful events (Folkman et al. 1987). Individuals apply problem-oriented and emotion-oriented coping strategies to handle stressful events (Folkman et al. 1987) and to reduce negative emotions

(Folkman and Lazarus 1980). Here, we examined emotion-oriented coping in the context of social contact restrictions, to establish a link to basic personality traits.

The Big Five model (John and Srivastava 1999; McCrae and 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 psycholexically (De Raad 2000) with psychometric approaches using factor analytical methods (O'Connor 2002). The Big Five personality traits extraversion and neuroticism, but also conscientiousness, are particularly strongly associated with perceived stress (Afshar et al. 2015). Individuals with high neuroticism tend to be anxious and insecure (Barrick et al. 2001), which leaves them vulnerable to psychological distress (Costa and McCrae 1992). Accordingly, neuroticism is related to lower

subjective wellbeing (Diener et al. 1999) and higher negative affect (Watson et al. 1988). Moreover, neuroticism is associated with a negative response to stressors in the environment (Costa and McCrae 1980) and an avoidant coping style (Bolger 1990; Parkes 1986). During the COVID-19 pandemic, individuals with high neuroticism showed higher levels of perceived threat from the virus (Liu et al. 2021), which in turn led to increased negative affect (Kroencke et al. 2020). In contrast, extraverts are considered social and gregarious individuals (Barrick et al. 2001) whose nature is characterized by a striving for activity and stimulation (Costa and McCrae 1992). When confronted with a stressor, extraverts are prone to problem-focused coping (Amirkhan et al. 1995; Penley and Tomaka 2002), need more social support, and tend to seek help (Amirkhan et al. 1995). In general, extraversion is associated with lower levels of perceived stress (Schneider et al. 2012). In light of social isolation during the COVID-19 pandemic, however, extraversion has been related to an increase in perceived stress, especially during the first wave of the pandemic (Zacher and Rudolph 2021). In general, extraversion is also positively correlated with wellbeing (Diener et al. 1999), positive affect (Lucas et al. 2008; Watson and Clark 1997), and positive mental health (Weiß et al. 2022; Lamers et al. 2012). However, when opportunities to engage in social activities were limited during the COVID-19 pandemic, extraversion lost some of its protective value for well-being (Gubler et al. 2021). Note that living with contact restrictions is strongly associated with adherence to rules. Conscientiousness may therefore have a positive effect on coping with these restrictions since conscientious individuals are characterized by their rule-abiding and self-disciplined nature (Barrick et al. 2001; Costa and 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 did not expect any direct relation to coping with contact restrictions.

In summary, neuroticism is a vulnerability factor related to negative mood and lower psychological well-being, especially for individuals with symptoms of depression and anxiety disorders. Extraversion is considered a protective factor linked to positive affect. However, the social isolation in the COVID-19 pandemic may have led to a different influence of trait extraversion on mood, causing a decrease in positive affect or an increase in negative affect. Instead, conscientiousness could function as a protective factor in this situation as long as the COVID-19-related contact restrictions were established with a transparent set of rules. Adherence to rules may not only ensure health but also lead to the satisfaction of contributing to the common good.

Here, we focused on three consecutive weeks of the first wave of the COVID-19 pandemic in 2020, during which contact restrictions were progressively relaxed in Germany. Based on the characteristics of the relevant Big Five traits, we have derived the following hypotheses.

H1. Because of extraverts' need for social interaction, we predicted that extraverts would have difficulties coping with the restrictions, especially at the first time of measurement when contact was strongly limited. Thus, we expected a negative correlation between extraversion and coping with restrictions, which is assumed to become less negative over time (H1a). Moreover, the influence of strict and less strict restrictions on the well-being of individuals high in extraversion should be visible in a less positive (or no) correlation between extraversion and positive affect at the first measurement and a more positive correlation between extraversion and positive affect at the second and third measurements (H1b).

H2. Regardless of the relaxation of restrictions, neuroticism was expected to relate to poor coping (i.e., a negative correlation), as the overall situation should remain threatening to neurotic individuals (H2a). This would be reflected in a positive correlation of neuroticism with negative affect at all three measurement times (H2b).

H3. High conscientiousness should correlate positively with coping across time since rule-oriented behavior fulfills a positive self-purpose for this group of individuals.

## MATERIALS AND METHODS

### Participants

In an online study, 51 individuals ( $M_{age} = 25.88$ ,  $SD_{age} = 9.91$ , 92% female, 61% students, 71% Bavarian residents) participated in the first of three measurements (T0), 36 participated in the second measurement (T1;  $M_{age} = 25.28$ ,  $SD_{age} = 10.8$ , 97% female), and 32 participated in the third measurement (T2;  $M_{age} = 25.31$ ,  $SD_{age} = 11.33$ , 97% female). As we did not precompute the

sample size, we estimated and reported the sensitivity of significant results using G-power (Faul et al. 2007) for multiple linear regressions ( $N = 32$ ,  $\alpha = 0.05$ , six predictors). The protocol was approved by the local ethics committee of the department of psychology of the Julius-Maximilians-University of Würzburg (protocol number GZEK 2020-25). The study was carried out in accordance with the recommendations of “Ethical Guidelines, The Association of German Professional Psychologists” (“Berufsethische Richtlinien, Berufsverband Deutscher Psychologinnen und Psychologen”) with informed consent from all participants.

### Procedure

The study was conducted in Germany. Therefore, the timepoints of measurement were based on the respective regulations (<https://www.bundesgesundheitsministerium.de/coronavirus/chronik-coronavirus.html>; accessed on 17 May 2020). At T0 (calendar week 18, 2020), people could meet one person from another household outdoors. At T1 (calendar week 19, 2020), it was permitted to visit close family members and one person outside the household. During this week, the regulations were adapted so that two households were allowed to visit each other privately. At T2 (calendar week 20, 2020), for example, shops reopened regardless of their size (wearing a mask was required).

### Rating Instruments

At each timepoint, we assessed the Big Five Inventory-SOEP (BFI-S; Schupp and Gerlitz 2008) and the Positive and Negative Affect Schedule (PANAS; Breyer and Bluemke 2016). Participants were instructed to answer the PANAS items about how they felt at the moment. To identify coping with contact restrictions, we generated 20 new items such as “I can do well on my own.”, “I adhere to the existing contact restrictions.”, or “I am very afraid that social contact will also be restricted in the future.” For descriptive statistics of the questionnaire data, including reliability, see Table S1. An intercorrelation matrix of the variables can be found as Table S2 in the supplemental material. Additional figures depicting the correlations of extraversion, conscientiousness, and neuroticism with the outcomes, i.e., coping, positive affect, and negative affect, can be found as Figures S1–S3 in the supplemental material.

### Analyses

Linear mixed models with a random intercept for participants were conducted to analyze change over time for the outcomes of coping, positive, and negative affect. The fixed predictors were the Big Five traits, the three time points (T0–T2), and their interaction. Due to the high reliabilities of all Big Five traits

(intraclass correlation coefficient [ICC] = 0.76–0.91), coping behavior (ICC = 0.845), positive affect (ICC = 0.565), and negative affect (ICC = 0.568), we correlated the average over time per trait with the three outcome variables to obtain higher trait variance (e.g., Hagemann et al. 2005) and report the corresponding Bayes factors.

## RESULTS

The linear model for coping revealed that higher conscientiousness resulted in better coping with contact restrictions ( $\beta = 0.344$ ,  $p < 0.001$ , power = 0.637, Figure 1, Panel C). The interaction between time and extraversion showed that higher extraversion was associated with better coping at T1 compared to T0 ( $\beta = 0.238$ ,  $p = 0.018$ , power = 0.380, Figure 1, Panel B) and marginally better coping at T2 compared to T0 ( $\beta = 0.147$ ,  $p = 0.069$ ). For neuroticism, there was a marginal effect in general ( $p = 0.076$ ), indicating poor coping with contact restrictions ( $\beta = -0.144$ , Figure 1, Panel A). A marginal effect for the interaction of agreeableness and time suggested a significant improvement of coping from T0 to T2 ( $\beta = 0.227$ ,  $p = 0.03$ , Figure 1, Panel D).

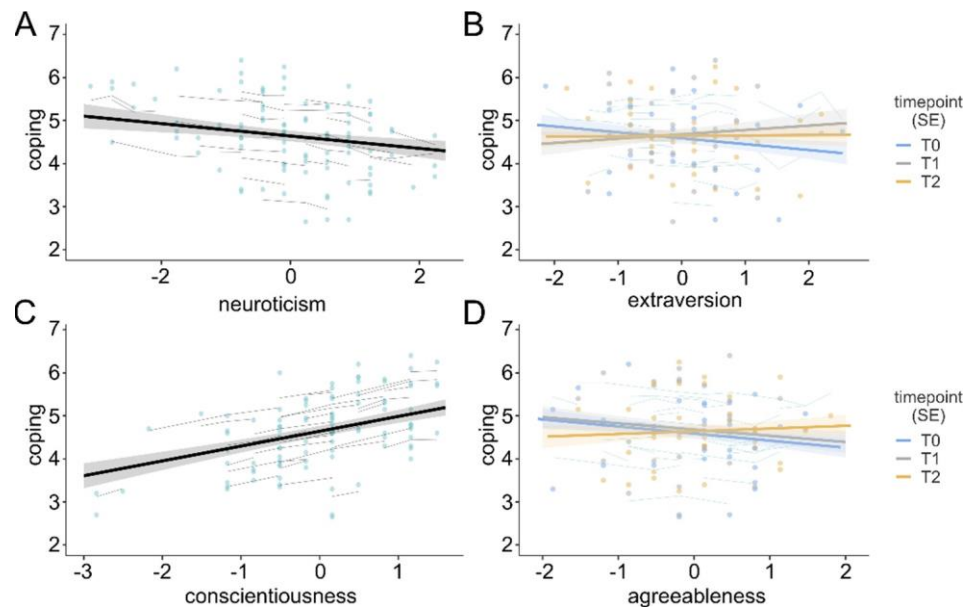


Figure 1. Relation of Big Five traits (mean-centered; Panel (A) = neuroticism, Panel (B) = extraversion, Panel (C) = conscientiousness, Panel (D) = agreeableness) and coping, including the different time points (blue = T0, grey = T1, yellow = T2). Shaded error bars mark standard errors; small lines show random effects.

For positive affect, only conscientiousness showed a significant effect ( $p < 0.001$ ), with higher conscientiousness leading to more positive affect ( $\beta = 0.279$ , power = 0.479, Figure 2, Panel A).

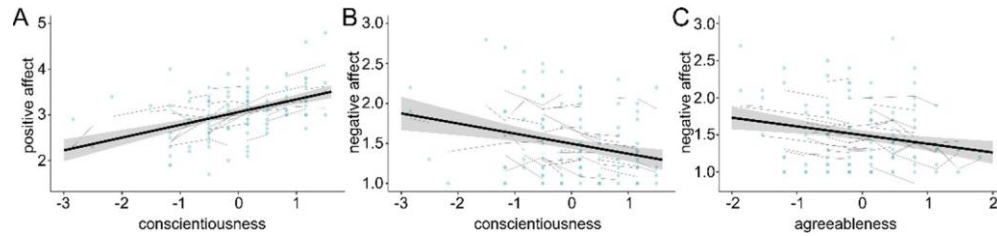


Figure 2. Relation between traits and positive and negative affect. Panel (A) depicts the relation between conscientiousness and positive affect, Panel (B) shows the relation between conscientiousness and negative affect, and Panel (C) indicates the relation between agreeableness and negative affect. Shaded error bars mark standard errors; small lines show random effects.

For negative affect, only marginal effects could be observed for conscientiousness ( $p = 0.062$ , Figure 2, Panel B) and agreeableness ( $p = 0.097$ , Figure 2, Panel C), both suggesting lower negative affect ( $\beta_{\text{conscientiousness}} = -0.126$ ,  $\beta_{\text{agreeableness}} = -0.117$ ).

The correlations of the means over time confirmed the main effects of coping and positive affect being positively related to conscientiousness ( $r_{\text{coping}} = 0.562$ ,  $p_{\text{coping}} < 0.001$ ,  $BF_{\text{coping}} = 46.19$ ,  $r_{\text{positive affect}} = 0.50$ ,  $p_{\text{positive affect}} = 0.004$ ,  $BF_{\text{positive affect}} = 12.70$ ) and negatively linked to neuroticism ( $r_{\text{coping}} = -0.414$ ,  $p_{\text{coping}} = 0.018$ ,  $BF_{\text{coping}} = 3.149$ ,  $r_{\text{positive affect}} = -0.439$ ,  $p_{\text{positive affect}} = 0.012$ ,  $BF_{\text{positive affect}} = 4.54$ ). For negative affect, however, a positive relation to neuroticism was found ( $r = 0.433$ ,  $p = 0.013$ ,  $BF = 4.12$ ).

## DISCUSSION

We have investigated how the Big Five are related to coping with contact restrictions and to positive and negative affect during the first wave of the COVID-19 pandemic in Germany. For this purpose, we have assessed data for three consecutive weeks during which restrictions were reduced.

As hypothesized, we demonstrated that extraverted individuals showed poorer coping with strict contact restrictions as well as an improvement as these restrictions were relaxed. Consequently, restricted social contacts due to external sources (i.e., the government) seemed to be challenging for extraverts, as they were limited in acting out their natural characteristics like sociability and talkativeness (Barrick et al. 2001). Once they were allowed to visit their family and friends again, the severity of the impact decreased. However, contrary to our assumptions, we could not show that the facilitation of contact restrictions was

also reflected in a significant change in positive affect over time, underlining how strongly extraverts are dependent on a well-functioning social life (Lee et al. 2008). This coincides with findings by Lee, Dean, and Jung (Lee et al. 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 between personality traits and the given social setting. Massive changes in society, such as those resulting from fighting a pandemic, not only influence the direct course of infections in a desirable way but also influence protective factors for other diseases (such as depression or anxiety disorders) in an undesirable way. Global restrictions of social interaction such as the COVID-19- related no-contact orders have not been used to this extent for decades, and the impact on social and individual health is a complex interaction. Therefore, a protective function of extraversion on mental health may no longer be present during the pandemic, and thus, a different support structure for vulnerable individuals may be necessary.

Among individuals with increasing levels of neuroticism, we were able to demonstrate that the relaxation of restrictions had no substantial impact on coping, as there was no interaction with time for the negative relationship between neuroticism and coping. Since the easing of protective regulations did not imply the end of the pandemic, this lack of change reflects anxious aspects of trait neuroticism (Barrick et al. 2001). This lack of change also coincided with the negative correlation of neuroticism to positive affect and its positive correlation to negative affect. Overall, these findings fit very well with the previously found association of neuroticism with a lower perceived coping ability and increased negative emotions (Penley and Tomaka 2002).

Finally, we were able to show that highly conscientious individuals showed good coping independent of external events (i.e., contact restrictions). This may relate to their perception of themselves as capable of meeting situational demands, which in turn had a positive effect on complying with and managing contact restrictions during the pandemic (Penley and Tomaka 2002). Moreover, conscientious people showed a higher positive affect and, by trend, less negative affect, which corresponds to findings that have associated conscientiousness with emotions related to attentiveness, a facet of positive affect (Watson 2000). Thus, conscientiousness could be a protective factor against impaired psychological well-being in times of extensive restrictions of social interaction, as the positive affect of adhering to the outlined rules is not only protective from a virological perspective but also associated with recovery from depression and anxiety (Javaras et al. 2012).

### **Limitations**

Due to the small sample size, this study should be considered exploratory. Schönbrodt and Perugini (2013) have shown that a sample of at least  $N = 300$  is needed for correlations to stabilize (Schönbrodt and Perugini 2013). A larger

sample might allow for the detection of smaller effects and, for example, the investigation of mediating effects of personality traits. In addition, most participants were female, which limits the generalizability of the results. Another limitation is the restricted sample of German citizens. Because the lockdown was relatively short and pandemic casualty rates were low compared with other countries and later waves, this could have dampened the effects.

## CONCLUSIONS

In conclusion, we demonstrated that extraverts were affected by severe contact restrictions during the COVID-19 pandemic and partly benefited from the stepwise relaxation of these restrictions. Neuroticism was a constant vulnerability factor, as individuals with high neuroticism were coping rather poorly with the pandemic situation. In contrast, conscientious people were continuously coping well, possibly due to their tendency to enjoy following rules, which enabled them to create a predictable behavioral outcome (i.e., stay at home to stay healthy) in an unpredictable and uncertain world.

**Supplementary Materials:** The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/socsci11100466/s1>, Table S1: Reliabilities (Rel; Cronbach's  $\alpha$ ), means (M) and standard deviations (SD) for the COVID-19 restrictions coping questions, Big Five factors (extraversion, neuroticism, conscientiousness), and affect (positive, negative) regarding the three measurements (T0, T1, and T2); Table S2: Intercorrelation matrix of all Big Fives factors, positive and negative affect and coping with contact restrictions; Figure S1: Correlations between extraversion, neuroticism, conscientiousness, and the questionnaire regarding coping with contact restrictions during the COVID-19 pandemic; Figure S2: Correlations between extraversion, neuroticism, conscientiousness, and positive affect (PANAS) during the COVID-19 pandemic; Figure S3: Correlations between extraversion, neuroticism, conscientiousness, and negative affect (PANAS) during the COVID-19 pandemic.

**Conflicts of Interest:** The authors declare no conflict of interest.

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