

## Modeling Contextual Effects in Longitudinal Studies

Five-factor model personality traits (neuroticism, extraversion, openness, agreeableness, conscientiousness) are thought to be relatively impervious to environmental demands in adulthood. The coronavirus pandemic is an unprecedented opportunity to examine whether personality changed during a stressful global event. Surprisingly, two previous studies found that neuroticism decreased early in the pandemic, whereas there was less evidence for change in the other four traits during this period. The present research used longitudinal assessments of personality from the Understanding America Study (N = 7,109; 18,623 assessments) to examine personality changes relatively earlier (2020) and later (2021–2022) in the pandemic compared to pre-pandemic levels. Replicating the two previous studies, neuroticism declined very slightly in 2020 compared to pre-pandemic levels; there were no changes in the other four traits. When personality was measured in 2021–2022, however, there was no significant change in neuroticism compared to pre-pandemic levels, but there were significant small declines in extraversion, openness, agreeableness, and conscientiousness. The changes were about one-tenth of a standard deviation, which is equivalent to about one decade of normative personality change. These changes were moderated by age and Hispanic/Latino ethnicity, but not race or education. Strikingly, younger adults showed disrupted maturity in that they increased in neuroticism and declined in agreeableness and conscientiousness. Current evidence suggests the slight decrease in neuroticism early in the pandemic was short-lived and detrimental changes in the other traits emerged over time. If these changes are enduring, this evidence suggests population-wide stressful events can slightly bend the trajectory of personality, especially in younger adults.

**Funding:** Research reported in this publication was supported by the National Institute on Aging of the National Institutes of Health under Award Number R01AG053297 to ARS. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

The purpose of this research is to examine personality change during the coronavirus pandemic compared to pre-pandemic levels using longitudinal assessments of personality from the Understanding America Study (UAS) [ 18 ]. We construe these analyses as exploratory because this study will be the first study of change in personality measured relatively earlier (acute phase) and relatively later (adaptation phase) in the pandemic (pandemic assessments in 2020 and 2021–2022), and because previous findings were not consistent with theoretical expectations. We do expect, however, that neuroticism declined early in the pandemic because of the two previous studies. If this decline is apparent in the UAS sample, it will provide robust evidence that neuroticism was reactive to the pandemic. We do not expect change in the other four traits early in the pandemic based on our previous findings [ 14 ]. We do not make predictions about change in personality later in the pandemic or how change may differ by sociodemographic characteristics.

To put any potential change in personality in context, previous research has found that personality changes, on average, about one-tenth of a standard

deviation per decade of adulthood [ 17 ]. Regarding direction, neuroticism, extraversion, and openness tend to decline from younger to older adulthood, and agreeableness and conscientiousness tend to increase, although neuroticism and conscientiousness may change direction and increase and decrease, respectively, in older adulthood [ 17 ]. Although personality traits may change more in younger and older adulthood, compared to middle adulthood, we do not make specific predictions about age differences in personality change during the pandemic because the virus and the response to it has been unprecedented and its effects significant but different across age groups. Older adults, for example, faced a greater threat of severe disease and death, whereas younger adults faced more restriction on age-normative activities. If any differences are found, it would suggest a fruitful future direction to pursue to identify theoretical and empirical reasons for differential personality change by age. If changes are similar across age, it would suggest that personality is reactive to a global stressful event regardless of specific age-related stressors.

These two studies provided important insights into the early effect of the pandemic on personality. The present research builds on these initial findings in four critical ways. First, we seek to replicate the finding that neuroticism declined early in the pandemic in a larger national sample of adults in the United States. Second, we address whether the other traits changed in this larger and more diverse sample than the previous samples. Third, with assessments of personality in both 2020 and in 2021â€”2022, we evaluate differential patterns of personality change across the acute (2020) and adaptation (2021â€”2022) phases of the pandemic. Finally, with a relatively diverse sample, we test whether personality change was moderated by age, gender, race, Hispanic/Latino ethnicity, or education.

There is less evidence for change in the other traits from pre- to during the pandemic. Although extraversion was hypothesized to decline because pandemic restrictions (e.g., lockdowns, social distancing, event cancellations) reduced the ability to be sociable, the evidence is mixed: Extraversion decreased slightly in a sample of university students in Germany [ 16 ], whereas it did not change in a nationwide sample of adults in the United States accounting for sociodemographic characteristics [ 14 ]. No change was found for Openness, Agreeableness, and Conscientiousness in the American sample [ 14 ], and these traits were not measured in the German sample [ 16 ].

In contrast to natural disasters, which tend to be limited in geographic area, the coronavirus pandemic has affected the entire globe and nearly every aspect of life. There is a developing literature on how the pandemic might be shaping personality change. Early in the pandemic, during the acute phase, we examined personality change in a sample of adults from across the United States (ages 18–90). We hypothesized that neuroticism would increase because of pandemic-related stressors and the accompanying fear and uncertainty would lead to more feelings of emotional instability [ 14 ]. Surprisingly, however, neuroticism declined slightly between January/February 2020 and March 2020. Although surprising, it is consistent with anecdotal evidence that anxiety (one core aspect of neuroticism) declined early in the pandemic among individuals who typically suffer from anxiety [ 15 ]. Further, a small sample from Germany found that neuroticism was slightly lower among university students during the first coronavirus lockdown compared to their neuroticism measured before the pandemic [ 16 ]. Although modest, this current evidence suggests that, at least early in the pandemic, during the acute phase, there was a decline in neuroticism.

Previous research suggests that personal, but not collective, stressful events may be associated with personality change. Neuroticism, for example, has been found to increase after personal stressful [ 9 , 10 ] or traumatic [ 11 ] events. In contrast, collective stressful events, such as natural disasters, seem to be unrelated to personality change [ 12 , 13 ]. A study that examined personality change from before to after the 2011 earthquake in Christchurch, New Zealand, for example, found no change in any of the five traits from before to after the disaster (there was a slight increase in neuroticism among participants directly affected by the quake; [ 12 ]). In addition, in a sample measured twice after exposure to Hurricane Harvey, there was no evidence of mean-level change in any of the five traits, even among participants with the most exposure [ 13 ]. This literature thus suggests that personality traits are not responsive to natural disasters.

Since the beginning of the coronavirus pandemic, there has been interest in tracking its effect on psychological outcomes [ 1 ]. This published work has focused understandably on factors related to mental health. Many studies, for example, examined how symptoms of depression and anxiety [ 2 ], loneliness [ 3 , 4 ], and social support [ 5 ] changed compared to before the pandemic. In addition to aspects of mental and social well-being, the pandemic may have had an impact on more general ways of thinking, feeling, and behaving (i.e., personality). The five-factor model (FFM) [ 6 ] of personality operationalizes trait psychological function along five broad dimensions: neuroticism (the tendency to experience negative emotions and vulnerability to stress), extraversion (the tendency to be talkative and outgoing), openness (the tendency to be creative and unconventional), agreeableness (the tendency to be trusting and straightforward), and conscientiousness (the tendency to be organized, disciplined, and responsible). These traits are

relatively stable over time [ 7 ] but are theoretically thought to be responsive to environmental pressures [ 8 ], including stressful events. The coronavirus pandemic has offered the unique opportunity to examine how a global stressful event experienced by the whole population may change personality.

We also tested whether personality change was moderated by sociodemographic factors (age, gender, race, Hispanic/Latino ethnicity, education) by including an interaction term between each dummy-coded COVID variable and the sociodemographic factor in separate regressions for each interaction. For age, we also ran the same MLM analysis separately for three age groups: younger adults (

## Reference

[Practice-Based Clinical Inquiry in Nursing: Looking Beyond Traditional Methods](#)

[Simulation Scenarios for Nursing Educators: Making it Real](#)