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Psychological Resilience Early in the Covid-19 Pandemic: Stressors, Resources, and Coping Strategies in a National Sample of Americans

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Abstract

Spreading rapidly across the US beginning in the spring of 2020, the Covid-19 pandemic radically disrupted Americans' lives. Previous studies of community-wide disasters suggested people are fairly resilient and identified resources and strategies that promote that resilience. Yet the Covid-19 pandemic is in some ways unique, with high levels of uncertainty, evolving implications and restrictions, and varied and uneven impacts. How resilient were Americans as the pandemic progressed? What psychosocial resources and coping strategies facilitated adjustment as the country moved into a summer of uneven re-openings and re-closures? Data from a national sample of 674 Americans were gathered at the height of early lockdowns and peaking infections in mid-April, 2020, and again, five and ten weeks later. The study aimed to determine levels and sources of distress and to identify the resources and coping efforts that promoted or impeded resilience. Early levels of distress diminished to some extent over subsequent months while levels of wellbeing were comparable with usual norms, suggesting a largely resilient response. Covid-19-related stress exposure also decreased gradually over time. Older age, higher levels of mindfulness and social support, and meaning focused coping predicted better adjustment, reflecting resilience, while avoidance coping was particularly unhelpful. In models predicting change over time, approach-oriented coping (i.e., active coping, meaning-focused coping, and seeking social support) was minimally predictive of subsequent adjustment. Given the unique and ongoing circumstances presented by Covid-19, specific interventions targeting psychosocial resources and coping identified here may help to promote resilience as the pandemic continues to unfold.

Keywords

Covid-19; stressors; posttraumatic stress; social support; mindfulness; coping

Emerging abruptly in the Spring of 2020 in the United States, the Covid-19 pandemic substantially disrupted daily routines and threw plans into disarray. Nationwide, Americans were abruptly forced to navigate school and business closures, employment and housing insecurity, and drastic changes in social behavior. Individuals sheltered in place, travel and commerce ground to a halt, and overwhelmed medical facilities dominated the news. Yet within a matter of weeks, states began planning to implement reopenings, providing both hope and confusion to Americans who had endured these privations in an effort to flatten the

infection curve. In the following months, repeated openings and restrictions played out along with competing national narratives about the pandemic and the best way forward (Weible et al, 2020).

This study aimed to characterize a sample of Americans' experiences of stress and resilience in the face of Covid-19 from mid-April 2020, at the height of early infections and lockdowns through early July, spanning a period of phased reopenings to reinvigorate the economy. Although defining resilience remains somewhat controversial (Infurna, 2020; Park et al., in press), some have suggested that, based on previous community-wide disasters, resilience as reflected in consistent adjustment over time is the most common response (e.g., Galatzer-Levy et al., 2018). Other research suggests that recovery from initial heightened levels of distress may be more common, particularly when adversity involves extensive disruptions over an extended period of time (e.g., Infurna & Luthar, 2018). Resilience can be considered as achieving positive adaptation in the context of significant threat (Masten & Cicchetti, 2016) or as a process of quickly returning to a relatively stable healthy functioning following trauma exposure (Bonanno & Diminich, 2013).

The present study is based on the transactional stress/coping model (Lazarus & Folkman, 1984), which posits that while stress exposure leads to psychological distress, its impact is highly variable and modified by individuals' psychosocial resources and coping responses. Helpful psychosocial resources and coping strategies have been identified in the context of natural (e.g., floods), technological (e.g., nuclear meltdown), and terrorist-initiated (e.g., 9/11) community-wide disasters (Bonanno et al., 2007). However, factors identified as helpful in these contexts may or may not apply to Covid-19, an ongoing, evolving, and society-wide disruption with proscriptions on many common social behaviors (Centers for Disease Control, 2020a).

Both inter-and intra-personal resources can mitigate the effects of stressors on distress. For example, social support has long been recognized as lessening the impact of stress on mental health following community-wide disasters (e.g., Pietrzak et al., 2014). As a recent focus of resilience research, relatively little work has linked mindfulness to post-disaster adjustment, but some studies have found beneficial relations between mindfulness and post-traumatic distress (e.g., An et al., 2018). Research suggests that older age is often (e.g., Dell'Osso et al., 2013) but not always protective in disasters (e.g., Barat & Bhagawati, 2019). Age confers experience in coping with myriad stressors over the life course and may be a proxy for wisdom (e.g., Park et al, in press; Tang et al., 2017). However, given the disproportionate impact of Covid-19 on older adults (Centers for Disease Control, 2020b), it was unclear whether age might serve as a resilience or risk factor in the current context.

Regarding coping, many strategies generally regarded as helpful (Aldwin, 2007) have been associated with lower distress following community-wide crises such as earthquakes (e.g., Baral & Bhagawati, 2019) and terrorist attacks (e.g., Park et al., 2012). In particular, approach-oriented strategies such as active coping (concentrating efforts on changing a stressful situation), meaning-focused coping (reappraising the situation in a more positive way) and seeking social support (e.g., active attempts to get advice or emotional support from others) have been shown to promote adaptive outcomes (Aldwin, 2007; e.g., Park

et al., 2008). On the other hand, avoidant strategies that are generally maladaptive, such as substance use coping, have also been related to higher levels of distress, specifically following community-wide crises (e.g., Park et al., 2012).

Resilience was assessed as both doing well and as decreasing in distress over time (Bonanno & Diminich, 2013). Measures of both general distress and distress specific to the pandemic, peritraumatic distress (PTD), were included. PTD concerns cognitive and affective distress responses regarding exposure to a severe stressor (e.g., helplessness, horror, fear for safety, grief; Brunet et al., 2001). Time 3 (T3) surveys also included measures of two aspects of positive wellbeing, positive states of mind and spiritual wellbeing. Specific research questions and hypotheses for this study were:

1. Characterizing Changes in Americans' Stress Exposure and Stress Appraisals

1a. How did exposure to Covid-19 stressors change from mid-April (T1) to late May (T2) to early July 2020 (T3)? No *a priori* hypotheses regarding change in stress exposure due to the unprecedented nature of the Covid-19 pandemic were made. *1b. How did cumulative stress appraisals change?* Similar to research question 1a, no *a priori* hypotheses were made.

2. Modeling Resilience as Doing Well in the Midst of the Pandemic

2a. By early July 2020, how did average positive and negative indicators of adjustment in this US-based Mechanical Turk (MTurk) sample compare to population norms? Given the ongoing stress of the pandemic, the present sample was expected to experience greater distress and lower wellbeing than that reported by normative samples. *2b. Do T1 psychosocial resources and T2 coping predict wellbeing and distress in early July 2020?* Mindfulness, social support, and approach-oriented coping (i.e., active, meaning-focused, support-seeking) were hypothesized to predict greater wellbeing and less distress. Younger participants and those who relied on avoidance coping were expected to demonstrate less adjustment (i.e., higher distress and lower wellbeing), reflecting less resilience, as were those reporting greater stressor exposure at the start of the pandemic. In addition to direct effects of mindfulness and social support on distress and wellbeing, indirect effects of these resources via coping were modeled, such that mindfulness and social support would promote more approach-oriented and less avoidant coping.

3. Modeling Resilience as Improving over Time

3a. How did general and Covid-19-specific distress change from mid-April to late May to early July 2020? On average, participants were expected to demonstrate resilience as reflected in initial experiences of emotional distress in response to Covid-19 stress that would decline over time. *3b. Do T1 psychosocial resources and T2 coping predict resilience as reflected in improvements in Covid-19-related distress from mid-April to early July 2020?* Building on hypotheses 2b and 3a, mindfulness, social support, and approach-oriented coping (i.e., active, meaning-focused, support-seeking) were expected to predict greater resilience (i.e., *improvement* in distress). Individuals with greater initial stress

exposure, younger participants and those who relied on avoidance coping were expected to experience worsening symptoms over time. A similar pattern of indirect effects of psychosocial resources on distress via coping was anticipated as articulated in Hypothesis 2b.

Method

Participants

Participants were recruited from the Amazon MTurk online worker pool. Eligible participants were aged 18 or older, residing in the US, and able to read English. After following best practice guidelines for online data cleaning at each timepoint to screen out suspicious or poor-quality responses (e.g., removal of inattentive cases and responses originating outside valid locations in the US, ensuring unique human responders as opposed to computerized bot responses), 1,544 high quality unique responses were available at baseline (T1), of whom 841 provided high quality data at T2, and 819 at T3; 674 participants provided good quality responses across all three timepoints for the present analyses. Cases were validated through the use of time to completion or “fast-responder” analysis that eliminated any response completed in less than 10% of the average completion time, Captcha screening, and location verification through GPS coordinate confirmation.

Studies using MTurk have found the data to be high quality, replicable, and valid across comparisons with frequently used academic platforms (Bartneck et al., 2015; Sheehan & Pitman, 2016). Although some studies suggest that MTurk respondents report slightly higher levels of depression than the general population (e.g., Ophir et al., 2019), others indicate mental health (as assessed by the DASS-21, also used in the present study) of MTurk workers approximates that of the general US population (e.g., Kim & Hodgins, 2017; Mortensen & Hughes, 2017).

Data Collection

The university IRB approved all study materials. Participants volunteered for the study on the MTurk homepage and provided informed consent prior to screening and completing T1 questionnaires. The project was advertised as an anonymous, longitudinal study of the impact of Covid-19 on daily life, providing participants with \$2 for completing the T1 survey and \$3 for subsequent surveys. Data presented here are drawn from the T1 survey, administered from April 8–25, 2020 (approximately 3 weeks after widespread US shelter-in-place recommendations were first issued), the T2 survey, administered from May 15–29, at which point many areas of the US had begun to implement reopenings, and the T3 survey, June 30–July 14, a period of additional reopenings but also sporadic viral surges, reclosures, and increased uncertainty.

Measures

Demographics.—At T1, participants reported on their location by state, financial security, whether they were a primary caregiver for a dependent, partner status, gender, sexual orientation, race, ethnicity, and age.

Covid-19 Stressors.—A novel measure of Covid-19 stressors (Tambling et al., in press) based on previous work during SARS and the early months of Covid-19 (Brooks et al., 2020; Qiu et al., 2020) assessed individuals' exposure to 23 stressors in the past week in three categories: infection-related stressors (8 items, e.g., "Have you experienced risk of becoming infected?"), activity-related stressors (10 items, e.g., "Have you experienced changes to social routines (e.g., spending free time with friends/loved ones)"); and financial stressors (5 items (e.g., "Have you experienced loss of current job security or income (e.g., inability to earn money)?") The total number of stressors experienced at each timepoint was tallied based on no/yes responses to each item. Participants rated the degree of stressfulness of each stressor experienced from 1 ("not at all") to 5 ("extremely"). As an index of cumulative stressfulness of exposure in each domain, all stress appraisals were tallied into a total score. Participants who did not experience any stressor in a category received a cumulative stressfulness score of "0" for that category. Preliminary evidence indicates the measure is unidimensional, internally consistent (reported $\alpha = .96$), and significantly associated with indicators of stress and anxiety, providing preliminary evidence of construct validity (Tambling et al., 2020). The Covid-19 stressor measure was administered at all three timepoints.

Mindfulness.—At T1, mindfulness was assessed using the 10-item Cognitive Affective Mindfulness Scale-Revised (CAMS-R; Feldman et al., 2007). The CAMS-R demonstrates strong psychometric properties in samples not regularly engaged in mindfulness training (Feldman et al., 2007). Items address present moment awareness and acceptance non-specific to stressful experience and are rated from 1 ("rarely/not at all") to 4 ("almost always"). Possible total scores range from 10–40. Present sample Cronbach's alpha was .89.

Social Support.—At T1, participants completed the 4-item appraisal subscale of the Interpersonal Support Evaluation List-12 (ISEL-12; Cohen et al., 1985) as a measure of the perceived availability of supportive others. The ISEL-12 has demonstrated strong psychometric properties in a wide range of samples. The appraisal subscale was selected as the most appropriate type of social support to assess given social distancing and barriers to interaction and travel during Covid-19. Items are rated from 0 ("definitely false") to 3 ("definitely true") and summed to create a total score (possible range for appraisal subscale = 0–12). Cronbach's alpha in the present sample was .87.

Covid-19-Specific Coping.—At T2, selected subscales from the Brief COPE (Carver, 1997) assessed the use of active coping ($r = .61$), behavioral disengagement ($r = .64$), substance use (4 items, $\alpha = .96$), emotional support-seeking ($r = .74$), and instrumental support-seeking ($r = .73$) over the past week on a 4-point Likert scale from 1 ("I haven't been doing this at all") to 4 ("I've been doing this a lot"). Subscale scores were taken as the average of items (range = 1–4). Selected two-item subscales from the CERQ-18 (Garnefski & Kraaij, 2006) also used to survey past-week coping with Covid-19-related stress included positive reappraisal ($r = .71$, $p < .001$), acceptance ($r = .62$, $p < .001$), positive refocusing ($r = .68$, $p < .001$), perspective taking ($r = .58$, $p < .001$), and self-blame ($r = .71$, $p < .001$). CERQ items were rated from 1 ("Almost never") to 5 ("Almost always"); subscale scores (sum of both items) ranged from 2–10). In structural equation models, latent factors

were created for meaning-focused (positive reappraisal, acceptance, positive refocusing, and perspective taking), support-seeking (emotional and instrumental support-seeking), and avoidance (behavioral disengagement, substance use, and self-blame) coping; active coping was modeled as a standalone observed variable. Factor loadings for each higher-order coping strategy are listed in Supplementary Tables 1 and 2.

General Distress.—Past-week general distress was assessed at T1, T2, and T3 using the 21-item version of the Depression, Anxiety, and Stress Scales (DASS-21; Lovibond & Lovibond, 1995). Items are rated from 0 (“Did not apply to me at all”) to 3 (“Applied to me very much or most of the time”). Summed scores are multiplied by 2 to create separate subscales, each ranging from 0–42). The DASS-21 demonstrated good psychometric properties in samples of Chinese exposed to Covid-19 (Wang et al., 2020) and MTurk workers (e.g., Arditte et al., 2016). Cronbach’s alphas in the present sample at T1, T2, and T3 were, respectively, .93, .94, and .94 for depression; .89, .90, and for anxiety, and .90, .90, and .91 for stress.

Covid-19-Specific Distress.—The Peritraumatic Distress Inventory (PDI; Brunet et al., 2001), a 13-item measure of distress during a trauma (in this case, specific to Covid-19), was administered at both assessment points in reference to the past week. In the present study, items were originally rated from 0 (“not at all”) to 3 (“extremely true”) at T1 (possible range = 0–39); the response option “1 (“slightly true.”)” was inadvertently omitted. This error was corrected at T2 and T3, such that participants were presented with the same items but had the option to rate their experience on a scale of 0–4 (possible range = 0–52). The PDI has shown strong psychometrics in previous research, including internal consistency and test-retest reliability and convergent and divergent validity. Cronbach’s alpha was .89 at T1, .91 at T2, and .90 at T3.

Wellbeing.—Wellbeing was assessed at T3, in reference to the past week. The 7-item Positive States of Mind Scale (PSOM; Horowitz et al., 1983) assessed participants’ ability to experience desired positive psychological states (e.g., focused attention, restful repose). Items were rated from 0 (“unable to experience this even though I have wanted to”) to 3 (“easy to experience”), with an additional option to mark items as “not relevant/have not wanted to experience” (these response options were excluded from the calculation of item mean scores). Cronbach’s alpha for the PSOM was .89 at T3 in the current sample, with total possible scores ranging from 0–3. The 8-item Meaning and Peace subscale of the FACIT-Sp (Peterman et al., 2002) measured spiritual wellbeing. Items are rated from 0 (“not at all”) to 4 (“very much”). Total possible scores range from 0–32; alpha = .93 at T3.

Analysis

Descriptive statistics and repeated-measures ANOVA with post-hoc Bonferroni correction for multiple comparisons in SPSS (version 26) characterize the number of stressors experienced at baseline and follow-up study periods (H1a) as well as the strength of change in stressor appraisals (H1b) and distress indices (H3a) from baseline to follow-up. Cohen’s *Dz* was used to characterize standardized mean differences for repeated-measures ANOVA (0.2 = small, 0.5 = medium, and 0.8 = large effect; Cohen, 1988) and corrected degrees

of freedom were used to minimize Type I error when sphericity was violated. Descriptive statistics were used to compare the follow-up distress reported by this sample at T3 with that of previous MTurk and trauma-exposed groups (H2a). Structural equation modeling in MPLUS (Version 8) was used to identify predictors of T3 distress and wellbeing (H2b) as well as predictors of change in distress from baseline (H3b). Participant age was grand-mean centered in structural equation models. Model fit was evaluated using the chi-square goodness-of-fit test, comparative fit index (CFI; Bentler, 1990, acceptable fit $\geq .90$), root mean square error of approximation (RMSEA; Browne & Cudeck, 1993; acceptable fit $\leq .08$) and standardized root mean square residual (SRMR; Hu & Bentler, 1999; acceptable fit $\leq .08$) statistics generated by MPLUS. Each of these fit indices are differentially effected by factors such as large sample size, model complexity, and the strength of associations between variables included in the model (Kline, 2016); thus, all four statistics were considered altogether when evaluating fit of the structural model to the observed data. In SEM models, maximum likelihood estimation with robust standard errors (MLR) was used to account for non-normality and a scaled chi square difference test was used for comparison of nested model fit (Satorra & Bentler, 2001). Due to extremely low rates of scale-level missingness ($< 2\%$) among completed responses, full imputation maximum likelihood (FIML) estimation in MPLUS was used to manage scale-level missingness.

Results

Sample Characteristics

Sample characteristics are reported in Table 1.

Question 1: Change in Covid-related Stressor Exposure and Stress Appraisal over Time

As shown in Figure 1, on average, participants reported significantly lower exposure to infection-related stressors from baseline to T2, with small reductions maintained at T3 (post-hoc comparison T1-T2 $dz = 0.28$, $p < .001$, T1-T3 $dz = 0.33$; $p < .001$; T2-T3 $dz = 0.07$, $p = .25$). Exposure to activity-related stressors decreased moderately from baseline to T2, with further significant reductions reported from T2 to T3 (post-hoc comparison T1-T2 $dz = 0.54$, $p < .001$; T1-T3 $dz = 1.00$, $p < .001$; T2-T3 $dz = 0.53$, $p < .001$). Similarly, participants experienced steady reductions in exposure to finance-related stressors over time (T1 $M = 1.69$, $SD = 1.16$; T2 $M = 1.26$, $SD = 1.13$; T3 $M = 1.00$, $SD = 1.06$; $F(2, 1319.97) = 150.19$, $p < .001$, post-hoc comparison T1-T2 $dz = 0.41$, $p < .001$; T1-T3 $dz = 0.62$, $p < .001$; T2-T3 $dz = 0.26$, $p < .001$).

As shown in Figure 2, change in cumulative stress appraisal for each category (i.e., sum of stress appraisals for each endorsed stressor) followed a similar pattern. Infection-related stress appraisals decreased significantly from baseline to T2, with moderate reductions sustained at T3 (post-hoc comparison T1-T2 $dz = 0.38$, $p < .001$; T1-T3 $dz = 0.44$, $p < .001$; T2-T3 $dz = 0.10$, $p = .03$). Reductions in activity-(post-hoc comparison T1-T2 $dz = 0.51$, $p < .001$; T1-T3 $dz = 0.93$, $p < .001$; T2-T3 $dz = 0.48$, $p < .001$) and finance-(post-hoc comparison T1-T2 $dz = 0.42$, $p < .001$; T1-T3 $dz = 0.64$, $p < .001$; T2-T3 $dz = 0.25$, $p < .001$) related stress appraisals decreased steadily over time.

Question 2: Modeling Resilience as Reflected in Distress and Wellbeing at T3

2a: Comparison of T3 Wellbeing and Distress with Population Norms—By T3, participants reported average depression ($M = 7.82$, $SD = 10.45$), anxiety ($M = 3.71$, $SD = 6.77$), and stress ($M = 7.90$, $SD = 9.20$) symptoms within the normal range (Lovibond & Lovibond, 1995). The average PDI score at T3 ($M = 8.47$, $SD = 8.31$) was also considerably lower than that typically reported for samples with direct trauma exposure (Thomas et al., 2012). Participants' average level of spiritual wellbeing ($M = 20.49$, $SD = 8.33$) was similar to that reported for college students (Finkelstein-Fox et al., 2018), and positive states of mind ($M = 2.32$, $SD = 0.66$) scores were similar to those reported by adults enrolling in a stress management intervention (Jain et al., 2007).

2b: Model of Resilience as Reflected in T3 Wellbeing and Distress—A hybrid structural equation model estimated structural associations between latent constructs (distress, wellbeing, and T2 meaning-focused, avoidance, and support-seeking coping) and measured constructs (age, total stressor exposure, mindfulness, and social support at baseline; T2 active coping) to identify correlates of wellbeing and distress. An initial structurally just-identified hybrid model (Kline, 2016) demonstrated acceptable fit ($\chi^2(130) = 854.415$, $p < .001$; CFI = 0.870; RMSEA = 0.091, 90% CI[0.085, 0.097]; SRMR = .059), with all standardized factor loadings ≥ 0.48 . A final model with non-hypothesized (i.e., direct paths between psychosocial resources/coping and adjustment) and statistically non-significant ($p > .05$) paths (age predicting T2 meaning-focused and active coping; correlations between the disturbances of T1 stressor exposure with social support and mindfulness; T1 mindfulness predicting T2 support seeking coping) deleted did not demonstrate significantly worse fit than the previous model ($\chi^2(135) = 861.476$, $p < .001$; CFI = 0.869; RMSEA = 0.089, 90% CI[0.084, 0.095]; SRMR = 0.060; adjusted $\Delta\chi^2(5\text{ DF}) = 6.68$); see Figure 3 (latent factor loadings and non-significant pathways omitted for parsimony). Coefficients are reported in full in Supplemental Table 1.

Question 3: Modeling Resilience as Reflected in Change in Distress Over Time

3a: Changes in Distress—Participants experienced statistically significant but small reductions in average anxiety from baseline to T2, with no further reductions at T3 (post-hoc comparison T1-T2 $dz = .18$, $p < .001$; T1-T3 $dz = .23$; $p < .001$; T2-T3 $dz = .07$, $p = .17$). In contrast, participants reported no significant change in stress between T1 and T2, with a slight reduction between T2 and T3 (post-hoc comparison T1-T2 $dz = .09$; $p = .065$; T1-T3 $dz = .24$, $p < .001$; T2-T3 $dz = .17$, $p < .001$). Participants experienced a moderately large reduction in PTD from T1 to T2, with a small additional decrease in symptoms by T3 (post-hoc comparison T1-T2 $dz = 0.64$, $p < .001$; T1-T3 $dz = 0.67$, $p < .001$; T2-T3 $dz = 0.10$, $p = .04$). Participants exhibited minimal change in depression over time (post-hoc comparison T1-T2 $dz = 0.06$, $p = .45$; T1-T3 $dz = 0.09$, $p = .06$; T2-T3 $dz = 0.04$, $p = .90$).

3b: Modeling Resilience as Reflected in T1 to T3 Reductions in Distress—A second set of hybrid structural equation models estimated predictors of residual change in distress over time, including all of the same variables as the model tested in Aim 2b, adding a latent variable for baseline distress, and removing the latent variable for T3 positive wellbeing. To ensure interpretable measurement model coefficients, T1 PTD was entered

into the model using its original 0–3 scoring (T3 PTD was measured using 0–4 scoring). A structurally just-identified structural model with partial metric invariance (i.e., allowing factor loadings for anxiety and PTD to be estimated freely) demonstrated adequate fit ($\chi^2(167) = 789.635, p < .001$; CFI = 0.911; SRMR = 0.059; RMSEA = 0.074, 90% CI[0.069, 0.080]). For the final structural model, non-hypothesized statistically non-significant ($p > .05$) paths (i.e., age predicting T2 meaning-focused, active, and support-seeking coping; T1 stressor exposure predicting T2 avoidance coping; correlated disturbances of T1 stressor exposure with mindfulness and social support) were deleted. The final model demonstrated acceptable fit ($\chi^2(173) = 795.562, p < .001$; CFI = 0.911; SRMR = 0.059; RMSEA = 0.073, 90% CI[0.068, 0.078]; adjusted $\Delta\chi^2$ on 6 DF = 5.65) and is presented in Figure 5 (latent factor loadings and statistically non-significant paths omitted for parsimony), with coefficients summarized in Supplemental Table 2.

Discussion

Our national sample of Americans reported high levels of exposure to various Covid-19-related stressors and appraised these exposures as highly stressful during the initial peak of Covid-19 in the US (Johns Hopkins University Center for Systems Science and Engineering, 2020). Stress exposure and appraisals diminished somewhat over time as various locations within the US implemented a patchwork of laws and guidelines regarding shelter-in-place and business and school reopenings and re-closures. While reductions in general distress were smaller than changes in Covid-19-specific stress appraisal, participants' reported distress indicated modest improvements as well, particularly for anxiety. Support for resilience, reflected in doing well in the midst of the pandemic, was further demonstrated in that average general distress scores were within the normal range, with Covid-19-specific distress considerably lower than that previously reported for samples with direct trauma exposure (e.g., Bell et al., 2017). Perhaps Americans were finding reassuring cues from public health reports at the time that suggested the US was seeing a “flattening of the curve” after the April 10th peak rate of new daily diagnoses (Johns Hopkins University Center for Systems Science and Engineering, 2020). Covid-19 rates were falling nation-wide during the data collection window--particularly compared to the weeks leading up to that initial peak--and although surges were reported across the country, states were beginning to implement reopening plans. This more hopeful context appears to be reflected in the decreasing distress reported here. In addition, individuals may have been adjusting to the “new normal” imposed by Covid-19-induced changes by finding alternative ways to meet their needs. It is important to note that while this sample of Americans generally appear resilient, people varied in how well they were doing and how much they improved over time. Many continue to suffer psychologically, which may bode poorly for their long-term mental health (Galea et al., 2020), as has been observed in previous community-wide disasters (North & Pfefferbaum, 2013). Thus, these results highlight our sample's general abilities to persist and recover but also identify key resources and coping strategies that may be targeted in intervention efforts.

The models of predictors of adjustment conceptualizing resilience as indicated in these two ways—first, as lower distress and higher wellbeing and second, as decreasing distress over time--were, as expected, fairly consistent with one another and with findings from other

community-wide disasters (e.g., Bonanno et al, 2010; Park & Blake, 2020). However, these models also demonstrated some important divergences from previous work and from one another, which makes sense: The first model predicted T3 distress and wellbeing while the second model predicted T3 distress taking into account T1 distress, effectively looking at residual change in distress over approximately 2.5 months. Importantly, this second model does not counter the static or underlying relations with resources and coping demonstrated in the first model but rather adds to these findings in terms of dynamic associations.

Consistent with expectations, older age was associated with less stressor exposure and baseline distress as well as higher levels of mindfulness and social support. However, older age was uniquely associated with slightly greater distress at T3 (and slightly worsening distress over time) when all pathways were held constant, indicating that protective effects of age on adjustment may be strongly dependent on stress regulation resources (Aldwin, 2007). In turn, both mindfulness and social support demonstrated salutary relations with distress and wellbeing through coping, as expected based on the transactional model of stress and coping (Park et al., in press). Higher levels of baseline social support and mindfulness predicted subsequently higher use of approach-focused coping (active coping, meaning-focused coping, and seeking social support) and lower levels of avoidance coping. Baseline mindfulness was also directly associated with less T3 distress, greater wellbeing, and decreased distress over time.

As expected, meaning-focused coping predicted lower distress and greater wellbeing at T3, although it did not predict changes in distress over time. Salutary effects of meaning-focused coping--viewing the situation more positively and accepting it--have been found in previous community-wide disasters such as the Japanese earthquake/tsunami/nuclear crisis (Cavanagh et al. 2014) and Hurricane Katrina (Wadsworth et al., 2009). This type of approach coping may be especially important in low-control situations (e.g., Finkelstein-Fox et al., 2019). Also as expected and consistent with prior research, avoidance coping predicted more distress and lower wellbeing as well as increased distress by T3 (Bonanno et al., 2010; Park et al, 2012).

Counter to expectations, other types of approach-oriented coping (active coping and seeking social support) had only minimal associations with distress and well-being. Covid-19 pandemic stressors may be less amenable to mitigating through direct actions, unlike in previously-studied disasters, which occurred quickly and then presented an aftermath in which active coping was essential to recovery (Park & Blake, 2020). Following most disasters, seeking social support relates to greater resilience (Bonanno et al., 2010); however, effects of support-seeking may have been outweighed by perceptions of received social support in the present analyses. In addition, these data were collected when individuals were generally isolated from others outside their homes and in close contact with a small group of household members, potentially straining the same close relationships from which they might seek support (Pietromonaco & Overall, 2020).

These results of coping are similar to those of a study of Germans early in the Covid-19 pandemic in which many types of coping were associated with levels of subjective wellbeing and positive and negative affect, but none were related to changes in wellbeing or affect over

time (Zacher & Rudolph, 2020). Results of both studies suggest underlying robust and stable relationships of resources and coping with distress and wellbeing (Aldwin, 2007).

Limitations

While reasonable for portraying trends and associations, MTurk workers do not comprise a nationally representative sample of Americans (Walters et al., 2018). Further, analyses included only participants who completed all three timepoints, and thus may not represent individuals whose circumstances changed over the course of the study. Models did not account for new stressors that emerged after baseline, such as increased racial unrest and political anxieties; this decision facilitated repeated-measures comparisons of exposure to the same stressors at each timepoint but precludes a full understanding of individuals' cumulative stress burden. The observational longitudinal design, while allowing some modeling of temporal ordering, does not allow for determining causality. Clearly, more assessments over a longer timeframe will be necessary to fully understand recovery and resilience (Chen & Bonanno, 2020), particularly given the implications of the pandemic for Americans' lives that reach beyond immediate threats; results may not generalize to later stages of coping with the pandemic. Indeed, to truly understand resilience, measures of distress and wellbeing prior to Covid-19 would need to be included (Chen & Bonanno, 2020; Infurna & Luthar, 2018). Some measures with suboptimal (e.g., Brief COPE) or preliminary (i.e., Covid-19 stressors) psychometric properties were used. Response sets in subjective responses could account for some of the results (Paulhus, 1991). In addition, in some cases, structural models demonstrated only acceptable rather than ideal fit, perhaps due to unmodeled coping cross-loading onto distress factors. Conceptual overlap between coping behaviors, well-being, and distress is not uncommon (Aldwin, 2007); accordingly model modification indices indicated that in many cases theorized coping, distress, or well-being factors might have had unmodeled intercorrelations (e.g., behavioral disengagement, depression, and meaning/peace).

Intervention Implications

The transactional stress and coping framework allowed us to home in on factors that may lead to better adjustment while living through an ongoing pandemic. Individuals' resources and coping strategies were the focus here, given that specific stress management interventions addressing them can be effectively delivered online (e.g., Heber et al., 2016). These findings suggest that interventions promoting mindfulness, social support, and coping skills to maintain engagement without avoidance behaviors may help individuals endure lengthy periods of social isolation with little control over many of the stressors at hand (e.g., Johnson et al., 2017).

These findings highlight needed supports in developing and maintaining social connections across a range of societal circumstances, including consistent and reliable information about how to ensure safe and satisfying social interactions. Meaning-focused coping may be helpful for individuals in finding ways to understand their stressful experiences in a less threatening, more positive way and to generate alternative ways to meet their needs. Effective coping in the pandemic may reflect managing one's stressful situation to the extent possible while accepting those aspects beyond control along with finding ways to

think about the situation more positively, focusing on potential benefits and longer-term consequences such as more quality time with family (e.g., Pietromonaco & Overall, 2020).

Implications for both long-term mental health and more immediate online and technology-assisted interventions follow from these results in light of the ongoing pandemic. The cumulative effects of the Covid-19 pandemic may worsen as it continues and individuals' resilience capacity is depleted (Kaslow et al., 2020). Many online interventions have already been developed to improve social support and increase mindfulness; these interventions may profitably be expanded in the current environment, which continues to restrict in-person socializing. Mental health professionals can provide suggested structure and content for broadly disseminated online resources promoting mindfulness and meaning-focused coping such as reappraisal and acceptance. Practices that counter rumination and anxiety by actively redirecting attention and reframing negative interpretations can be taught (e.g., Heber et al., 2016; Sweeny et al., 2012), and many mobile interventions for anxiety and stress management that are already available (e.g., Christensen et al., 2014) may be useful in dealing with the pandemic.

The observed evidence of resilience is reassuring, yet the pandemic persists and policy responses remain geographically varied in scope and direction. The long-term consequences of Americans' high levels of stress exposures requires swift action both to mitigate the pandemic's immediate adverse mental health effects, potentially dampening long-term sequelae, and to promote future resilient responding. Thoughtful, thorough policy-making by government leaders is also needed to prepare for the demands of increased mental health services in the months and years ahead (Auerbach & Miller, 2020; Galea et al., 2020).

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Public Significance Statement

A national sample of 674 Americans surveyed at the height of early lockdowns and peaking Covid-19 infections in mid-April, 2020, and again, five and ten weeks later reported lower levels of Covid-19-related stress exposure and distress while levels of wellbeing were comparable with usual norms, suggesting a largely resilient response. Older age, higher levels of mindfulness and social support, and meaning focused coping predicted better adjustment while avoidance coping was particularly unhelpful. Mental health professionals can provide suggested structure and content for broadly disseminated online resources promoting mindfulness and meaning-focused coping such as reappraisal and acceptance.

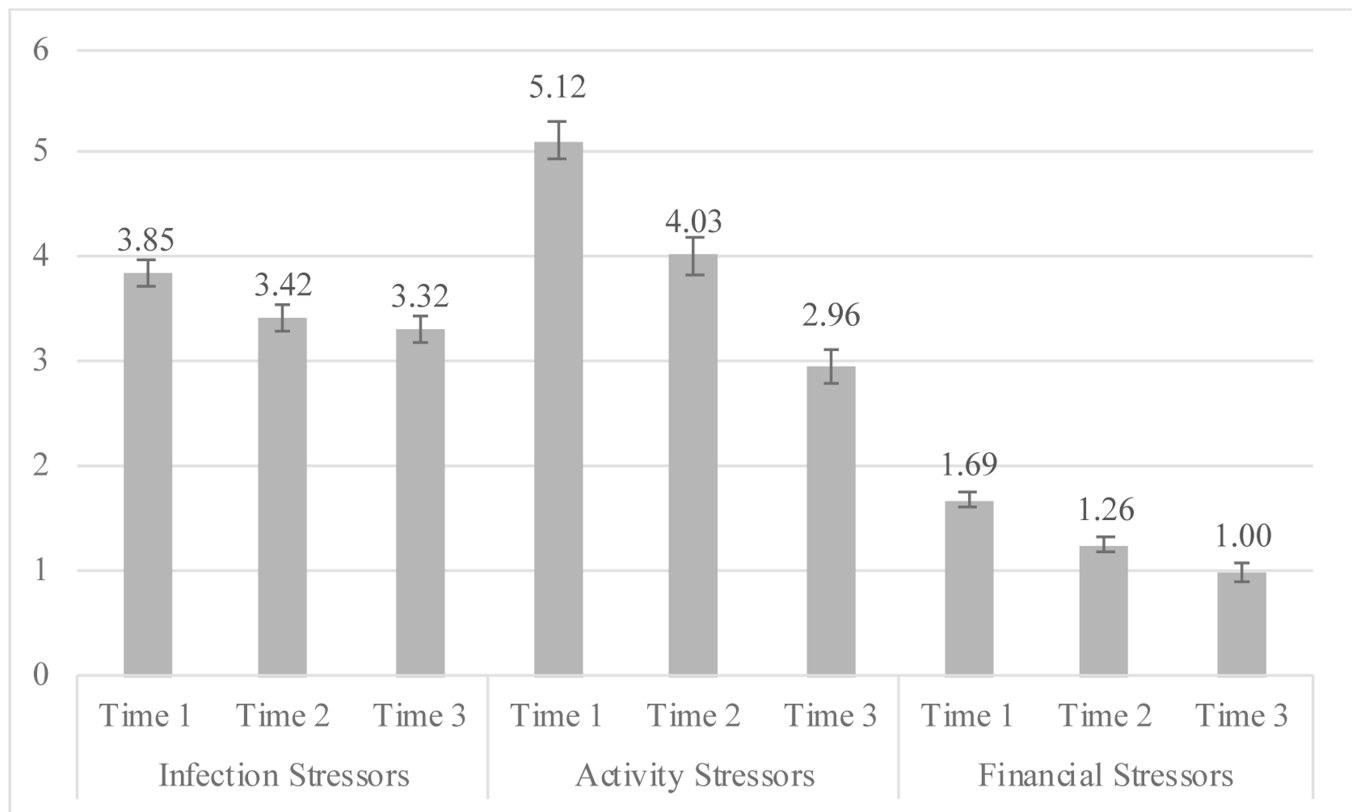


Figure 1.

Average number of stressors at each timepoint, by domain

Notes. Possible range for infection stressors = 0–8, activity stressors = 0–10, financial stressors = 0–5. Bars represent 95% confidence interval.

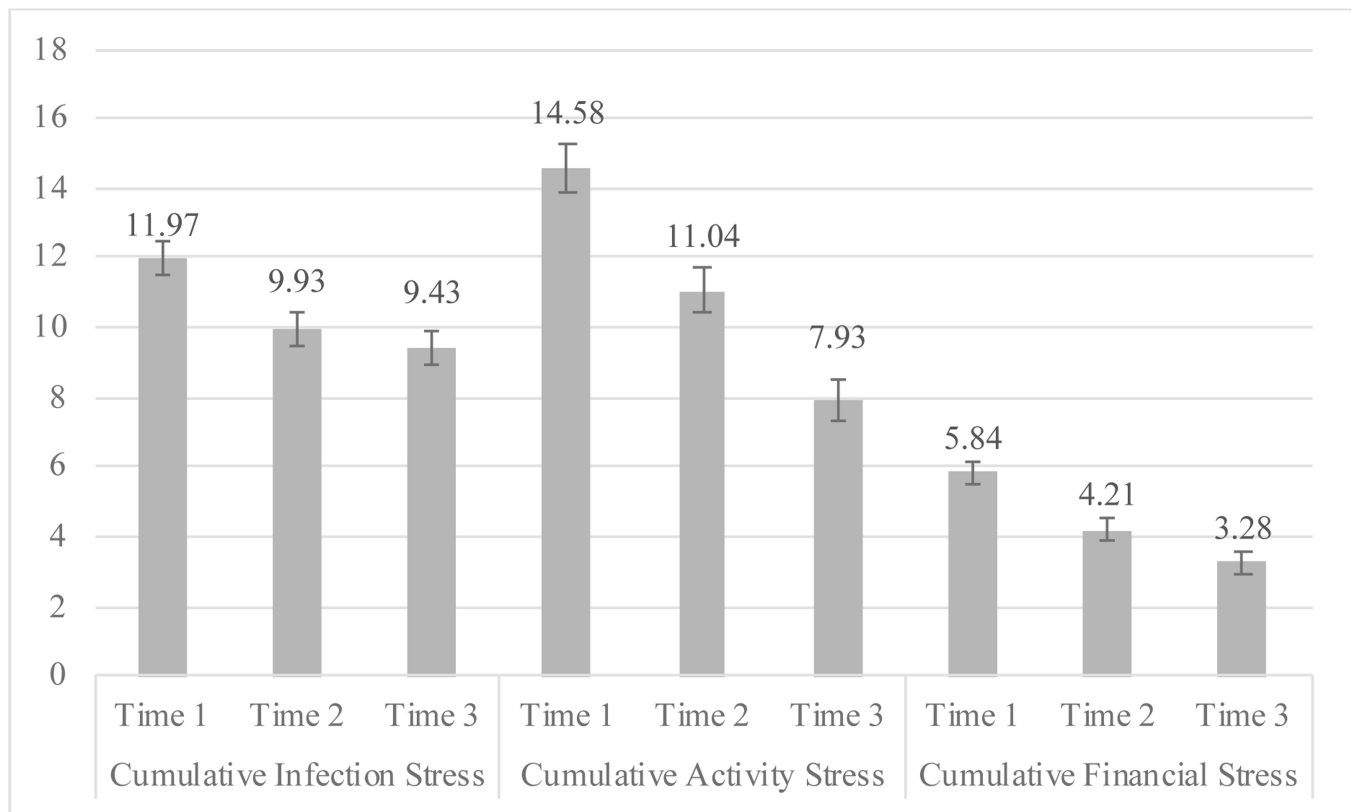


Figure 2.

Average cumulative stress appraisal at each timepoint, by domain

Notes. Possible range for infection stressors (8 items) = 0–40, activity stressors (10 items) = 0–50, financial stressors (5 items) = 0–25. When no stressors from each category were experienced, cumulative stress appraisal was coded as 0. Bars represent 95% confidence interval.

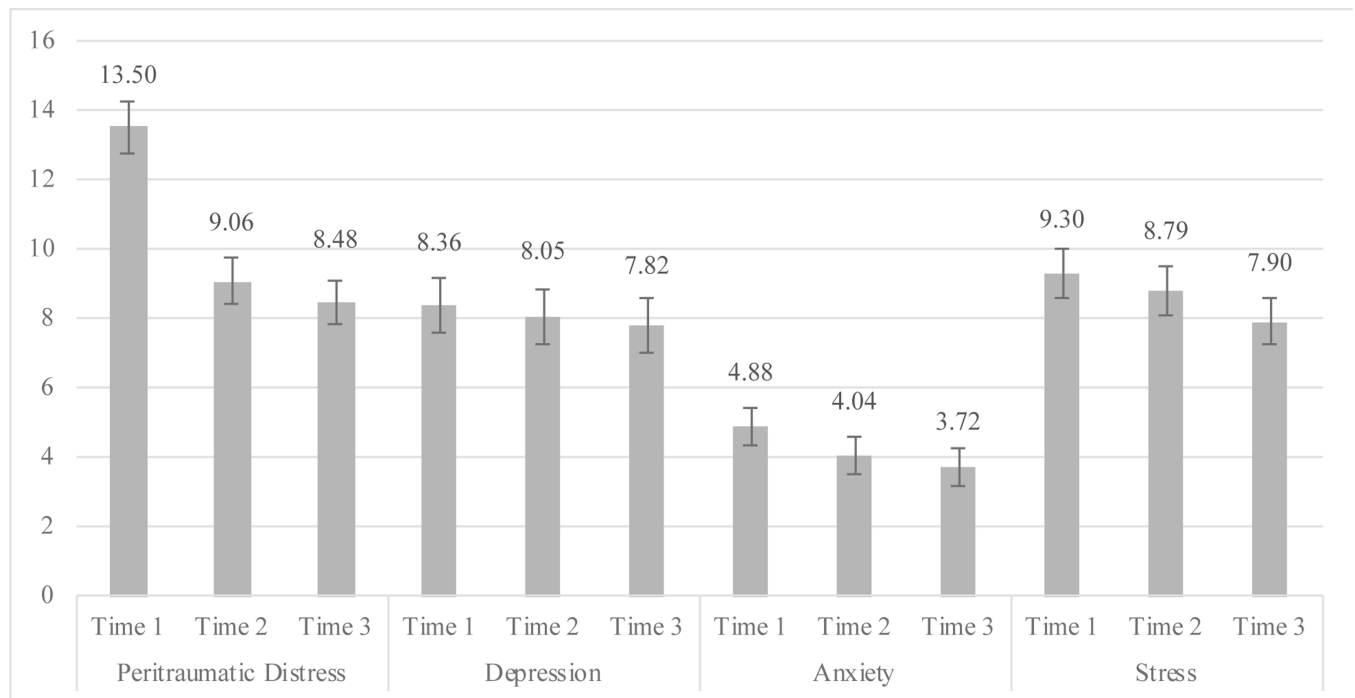
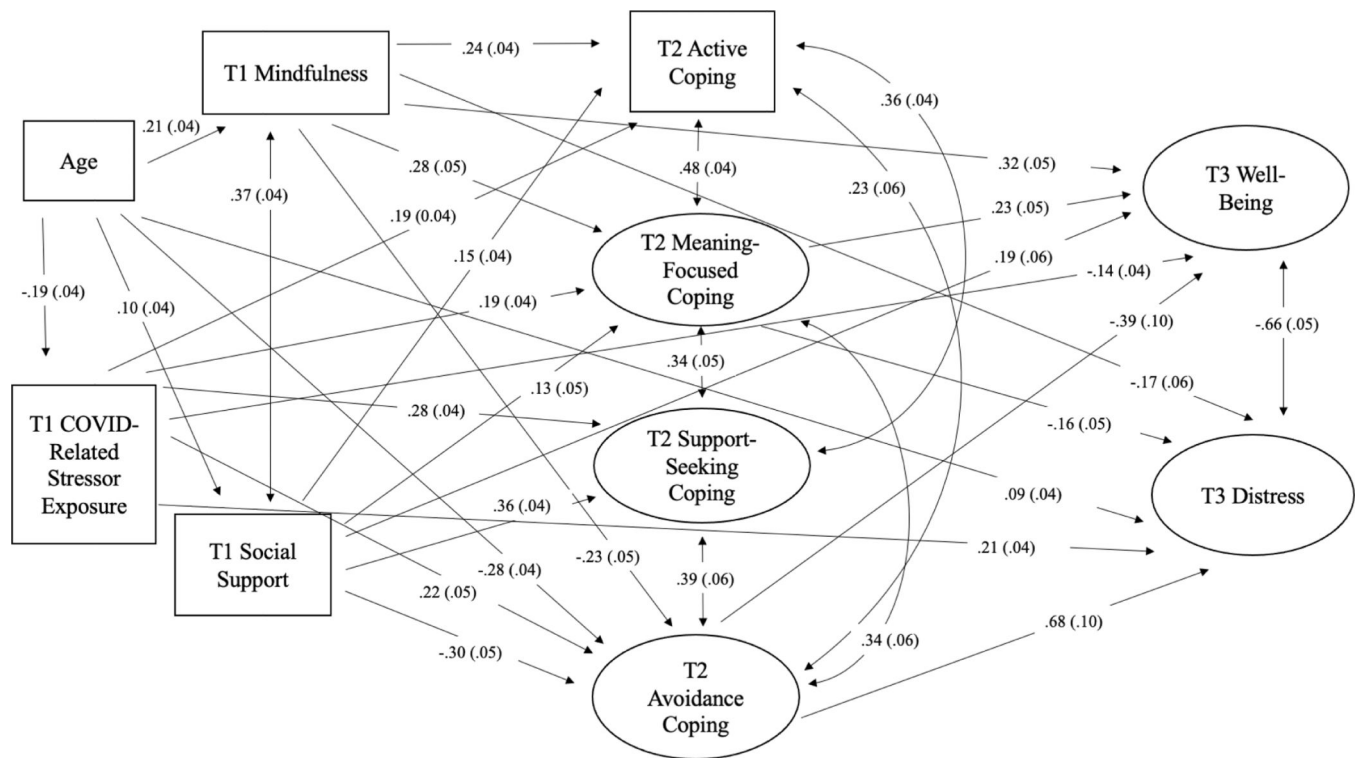


Figure 3.

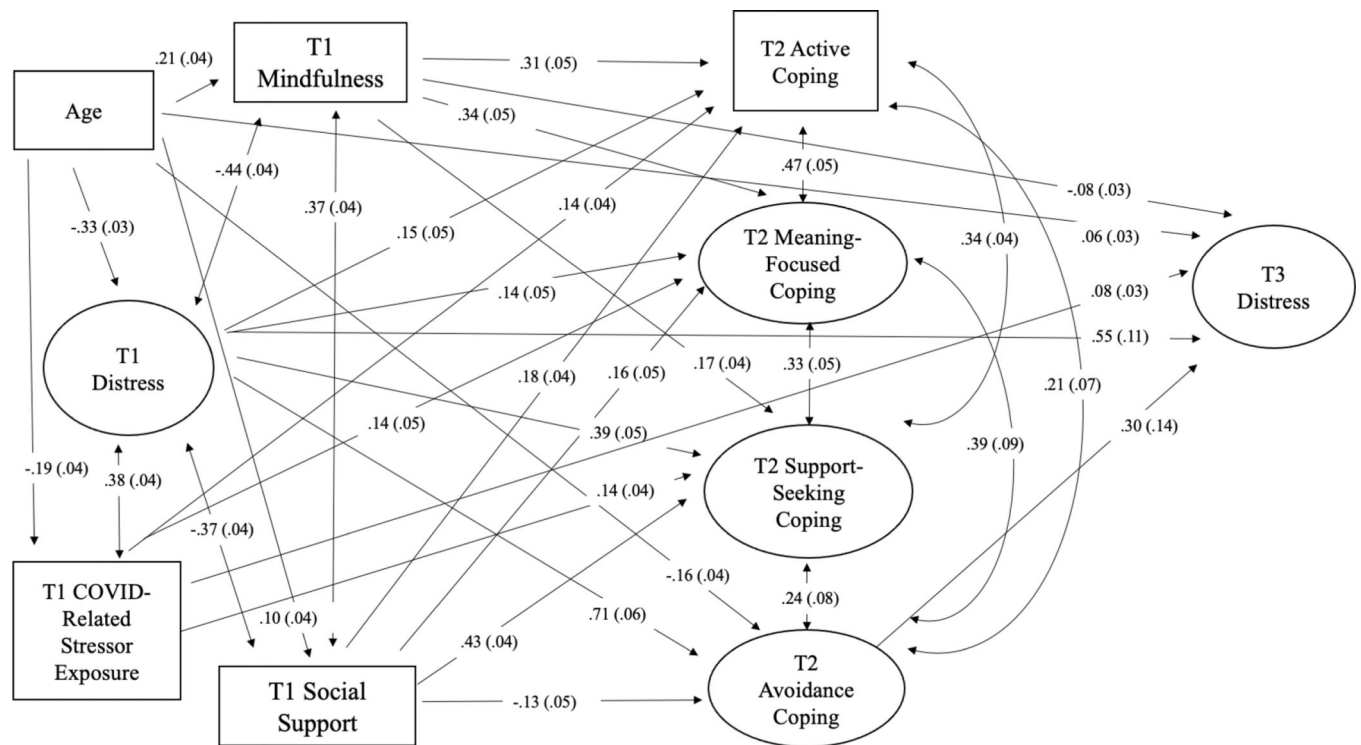
Average distress at each timepoint, by domain

Notes. PTD items were originally rated from 0 (“not at all”) to 3 (“extremely true”) at baseline; inadvertently excluding the response option “1 (“slightly true.”)” This error was corrected at follow-up, such that participants were presented with the same items but had the option to rate their experience on a scale of 0–4. To facilitate comparison between timepoints, T1 PTD items were re-scored to a 0–4 scale, omitting “1 (“slightly true.”)” responses. Bars represent 95% confidence interval.

**Figure 4.**

Final Structural Model for Resilience as Levels of T3 Distress and Wellbeing

Notes. Latent variable indicators and statistically non-significant paths are omitted for parsimony (see Supplemental Table 1). Ovals indicate latent variables; rectangles indicate measured variables. Doubled-headed arrows indicate correlated disturbances for endogenous variables (i.e., “with” pathways); single-headed arrows indicate hypothesized causal paths (i.e., “on” pathways). Path coefficients represent standardized estimates from the structural model with standard errors in parentheses.

**Figure 5.**

Final structural model for Resilience as Decreases in Distress Over Time

Notes. Latent variable indicators and statistically non-significant paths are omitted for parsimony (see Supplemental Table 2). Ovals indicate latent variables; rectangles indicate measured variables. Doubled-headed arrows indicate correlated disturbances for endogenous variables (i.e., “with” pathways); single-headed arrows indicate hypothesized causal paths (i.e., “on” pathways). Path coefficients represent standardized estimates from the structural model with standard errors in parentheses

Table 1:

Demographics of the sample

	μ (SD)
Age	40.8 (14.34; range = 20–88)
	N (%)
Gender	
Male	294 (43.6%)
Female	368 (54.6%)
Other (i.e., non-binary, transgender, self-described, or prefer not to say)	12 (1.8%)
Race	
Black/African American	89 (13.2%)
Asian/Asian American	86 (12.8%)
Native Hawaiian/Other Pacific Islander	35 (5.2%)
American Indian/Alaska Native	43 (6.4%)
White	541 (80.3%)
Ethnicity	
LatinX	41 (6.1%)
Non-LatinX	633 (93.9%)
Sexual Orientation	
Straight/Heterosexual	607 (90.1%)
Gay or Lesbian	26 (3.9%)
Bisexual	27 (4.0%)
Prefer to self-describe or prefer not to say	14 (2.0%)
Geographic Region	
West	153 (22.7%)
MidWest	127 (18.9%)
South	261 (38.7%)
NorthEast	132 (19.6%)
Partner Status	
Married	278 (41.2%)
Single	227 (33.7%)
Cohabiting with a significant other	89 (13.2%)
Divorced	62 (9.2%)
Widowed	12 (1.8%)
Separated	6 (0.9%)
Caregiver Status	
Caregiver	159 (23.6%)
Non-Caregiver	515 (76.4%)
Shelter In Place Guidelines (T2)	
Active	470 (69.7%)
Non-Active	204 (29.3%)

	μ (SD)
Age	40.8 (14.34; range = 20–88)
	N (%)
Shelter In Place Guidelines (T3)	
Active	210 (31.2%)
Non-Active	464 (68.8%)

Note: For descriptive purposes, states were categorized into four distinct regions based on divisions used in the US Census (2020).