COPING WITH THE COVID-19 PANDEMIC: EXAMINING MEANING-MAKING IN A SOCIOECOLOGICAL FRAMEWORK

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by
Emilia Eva Mikrut

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Emilia Eva Mikrut

Elizabeth Brondolo

ABSTRACT

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Emilia Eva Mikrut

During 2020, the COVID-19 pandemic emerged as a threatening, unpredictable, and uncontrollable stressor. Meaning-making, or one's ability to make sense of a stressful life event, integrate the event into one's narrative of the world and meaning in life, and accordingly revise life goals, is a salient intrapsychic process contributing to psychological adjustment in the face of very stressful or traumatic experiences such as chronic health issues, interpersonal grief, and natural and man-made disasters. Early findings provide evidence for the critical role of meaning-making in coping with stressors associated with the COVID-19 pandemic. Though meaning-making is a universal process, one's capacity to do so may be fundamentally shaped by contextual factors related to social determinants of health (SDoH; i.e., the social, cultural, and economic factors that affect health status). However, relations of these factors to meaning-making during the pandemic are not yet fully understood. Further, it is not yet known how meaning-making may mediate the link between SDoH and mental health in the content of COVID-19. The aim of this study is to evaluate pathways by which a broad range of individual and community level SDoH influence meaning-making and mental health outcomes during the pandemic. In a nationally representative sample of 572 American adults, stressors associated with individual SDoH and COVID-19 burden were linked

with disrupted meaning made of the pandemic and poorer mental health outcomes marked by greater anxiety and depressive symptoms. However, community stressors reflective of neighborhood burden were not linked with psychological processes. A serial mediation model in which the pathway between individual SDoH burden and psychological distress operates indirectly through individual COVID-19 burden and meaning made of the pandemic was supported. These findings suggest that individual stressors associated with SDoH may be a key force in shaping mental health outcomes during the pandemic, potentially through their relations with increased personal COVID-19 disease burden and lower capacity to make meaning of the pandemic. Findings may be used to guide psychotherapeutic assessment and interventions and to inform public health messaging and policy change around social determinants of health and COVID-19 health disparities.

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Statement of the Problem

The COVID-19 pandemic has been associated with a deterioration in mental health across the population, marked by increased symptoms of depression, anxiety, suicidal ideation, and post-traumatic stress (Wanberg et al., 2020; Sherman et al., 2020; Rettie & Daniels, 2021; McKnight-Eily, 2021; Panda et al., 2021). According to aggregated data provided by the Center for Disease Control and Prevention (CDC), the general U.S. adult population rate of depression increased from 7% in 2019 to 28.6% in 2020, and the rate of active suicidal ideation increased from 4.8% in 2019 to 8.4% in 2020 (McKnight-Eily, 2021). Some research suggests the rate of mental health issues has only increased over time, with estimates from the CDC highlighting that approximately 40% of adults were reporting symptoms of anxiety and depression during the second year of the pandemic, 2021 (Vahratian et al., 2021; Bakkeli, 2022). However, research conducted later in the pandemic has revealed varied results, with some studies indicating limited or no long-term mental health problems and others suggesting the presence of continued distress (Robinson et al., 2022).

Notably, members of communities historically burdened by social determinants of health (i.e., People of Color (POC), gender and sexual identity minorities, those of lower socioeconomic status) have faced greater psychological consequences associated with the pandemic compared to individuals who have more resources or belong to social majority groups (i.e., white individuals, cisgender men, those of higher socioeconomic status; Novacek et al., 2020; Alegria et al., 2022). These findings suggest there may be

important factors influencing heterogeneity in mental health outcomes throughout the course of the pandemic.

Though psychological distress is experienced on the individual level, the manifestation and maintenance of mental health conditions are shaped by the social and physical environment. According to the socioecological model, individual well-being is influenced by a complex interplay of societal, community, and interpersonal factors (Bronfenbrenner, 1979). Societal factors include social and cultural norms, economic and legal policies, and broad economic conditions. These factors affect the conditions of one's community, such as the quality of the natural and man-made environment, housing and employment quality, and access to important organizations and institutions like schools, hospitals, banks, and stores. In turn, societal and community-level characteristics shape the quality and quantity of interpersonal relationships between friends and family members, parents and children, and neighbors. These societal, community, and interpersonal conditions influence individuals' stress exposure and stress responses. In turn, individuals experience and respond to these conditions idiosyncratically based on their own specific histories and social environment (i.e., social process), their perception and understanding of the world (i.e., psychological process), and their physiological predispositions and exposures (i.e., biological process).

Threatening, unpredictable, and uncontrollable events such as the COVID-19 pandemic not only dramatically shift people's life circumstances, they may also elicit a direct confrontation with mortality and the internal anxiety it produces (Pearlin, 1989). Such events or stressors that are related to death often initiate an intrapsychic process of meaning-making. Meaning-making during the pandemic entails making sense of and

integrating COVID-19 into one's understanding of the world and accordingly revising personal values, goals, and life narratives. Meaning-making can foster a newfound understanding of oneself, others, and the world (Park & Folkman, 1997). Effective meaning-making is linked to greater psychological adjustment and reduced psychological distress (Yang et al., 2021; Milman et al., 2020; Milman et al., 2022).

However, basic-level needs such as shelter, nourishment, and support from others in the community are needed to nurture psychological functions, including the task of adjusting to new and stressful circumstances and finding meaning in stressful events (Maslow, 1943). As such, the capacity for individuals to psychologically process and respond to the COVID-19 pandemic - and make meaning of it - is likely profoundly tied to their environmental, material, and social circumstances. During the pandemic, these basic needs have been devastatingly threatened due to the socioeconomic consequences of the public health emergency, restricting effort available to cope and endangering mental health outcomes.

Social Determinants of Health and Psychological Well-being

Psychological well-being is fundamentally shaped by social determinants of health (SDoH), defined as the social, cultural, and economic conditions in which people live and work (Marmot & Wilkinson, 2005; Allen et al., 2014). Conceptually, SDoH refer to issues or deficits that present across the domains of economic stability, neighborhood and physical environment quality, education, food access, community and safety factors, and health and healthcare system factors (Marmot & Wilkinson, 2005). The association between various dimensions of SDoH and mental health has been consistently reported (e.g, Silva, et al., 2016; Allen et al., 2014; 2017; Fryers et al., 2003).

SDoH occur both on the community and the individual level (Bronfenbrenner, 1979). On a population or community-level, SDoH include issues such as high rates of poverty, unemployment, homelessness, crime, and environmental pollution. Community-level SDoH may drive the presence or absence of more individual health-related social needs. These health-related social needs (which will be referred to as "individual SDoH" throughout this paper for ease of communication) include personal experiences of food insecurity, housing instability, unemployment, interpersonal violence, discrimination, other forms of social harm, lack of social support, financial strain, limited or precarious (un)employment, gaps in health insurance and healthcare access, and engagement in poor health behaviors (Artiga & Hinton, 2019).

In examining the effects of community-level SDoH, epidemiological studies have shown that individuals living in neighborhoods with lower socioeconomic status (SES; typically indexed by education and income/poverty) suffer from disproportionately higher rates of mood disorders, serious mental illness, and suicidality than those of higher SES (Silva, et al., 2016; Samaritans; 2017; Fryers et al., 2003). Research has also examined the relations between other specific neighborhood-level SDoH characteristics, apart from just SES, and mental health. In one such study, worse social neighborhood characteristics (i.e., higher rates of crime, drug abuse, and frequent housing turnover) and physical neighborhood characteristics (i.e., greater air pollution, sound pollution) were associated with greater rates of clinical depression and anxiety (Generaal et al., 2019). Other studies have also examined the impact of institutional or cultural racism and other forms of prejudice (e.g., heterosexism) on mental health outcomes. For example, structural racism factors, including higher racial segregation tied to historical redlining, racial prejudice measured at the community level, and race-related public policies, have

been linked to poorer mental health outcomes among People of Color (POC; Medlock et al., 2019). Other studies published by Hatzenbuehler and colleagues (2009, 2010), found greater rates of psychiatric and behavioral health disorders among lesbian, gay, and bisexual residents living in states with local policies reflective of anti-LGBTQ stigma (e.g., same-sex marriage bans, lack of protection against employment discrimination and hate crimes based on sexual orientation) than individuals living in affirming states.

On an individual level, personal SES has similarly been linked with poorer mental health (Silva et al., 2016). When examining the unique relations between discrete individual SDoH domains and mental health, studies have found associations between poorer mental health outcomes (marked by higher levels of depression, anxiety, post-traumatic stress, and suicidality) and characteristics including unstable housing and food insecurity (Kuhn et al., 2020; Maness et al., 2014), unemployment (Modini et al., 2016), lower quality health insurance and healthcare access (Schroeder, 2007), and poorer health behaviors such as substance use, low physical activity, and poor diet (Oftedal et al., 2019). Additionally, there exists a rich literature on the impact of poorer quality social relationships (Fothergill et al., 2011; Santini et al., 2015) and experiences of interpersonal discrimination (Brondolo et al., 2016; Mikrut et al., 2022; Vargas et al., 2020) on mental health.

Though the overall conceptual and empirical link between SDoH and mental health is clear, prior research has produced varying findings with regards to the effects of discrete SDoH domains (e.g., economic stability, safety, food access, healthcare factors) and levels (e.g., individual vs. community) on psychological outcomes. Research examining the cumulative burden, or differing consequences, of all the domains subsumed within SDoH is limited (Alegria et al., 2018). A review of the literature

conducted by Silva and colleagues (2016) examined both the impact of individual level factors and community level factors on psychological distress across 150 studies. Several socially determined risk factors of poor mental health were identified including: individual lower income and education, unemployment, food insecurity, lack of social support, and perceived social stress, and neighborhood socioeconomic deprivation, violence, and poor air and water quality. However, conclusions could not be drawn about the differential impacts of community stressors vs. individually experienced stressors on mental health outcomes.

Further contributing to this problem is that wide variations exist in the methodology of evaluating SDoH burden, with prior investigators using either one of several, various self-report assessments of burden or neighborhood-level data to draw conclusions about the consequences of SDoH (Algeria et al., 2018). Often, research focused on the impacts of SDoH has been limited to the examination of socioeconomic status (SES), one domain of SDoH typically indexed by income and education. Notably, the review conducted by Silva and colleagues (2016) revealed that prior studies varied widely in the measures used to index both individual and community level SDoH factors, limiting ability to draw conclusions on the differential psychological consequences of various aspects of social determinants of health. This highlights a need to standardize the process of measuring SDoH burden, both within community and clinical contexts (Billioux et al., 2017).

Socioeconomic Consequences of the COVID-19 Pandemic

Socioeconomic inequalities in the U.S. have been worsening over time (Reeves, 2017) and this process was further fueled by the pandemic (Ryff, 2022; Drake & Rudowitz, 2022). The public health emergency incited regional and nation-wide

lockdowns and quarantine regulations, necessitated restrictions on social gatherings, and led to rapid fluctuations in the stock market and increased unemployment. These events further exacerbated socioeconomic difficulties and heightened health-related social needs (Ryff, 2022; Drake & Rudowitz, 2022).

Studies of the link between increasing unemployment and suicide rates, especially in the United States, are referred to as “diseases of despair”, highlighting societal awareness of the impact of material conditions on individuals mental and physical well-being (Ryff, 2022). Since the pandemic began in early 2020, several public health reviews have highlighted the importance of considering socioeconomic factors in health policy development and allocation of healthcare resources (Khalatbari-Soltani et al., 2020; Rangel et al., 2020).

The economic consequences of COVID-19 have affected individuals of lower SES most severely (Drake & Rudowitz, 2022; Fortuna et al., 2020). Research suggests that among members of historically marginalized and underserved communities, insecurity surrounding food, public benefits, housing, and legal support significantly increased following the pandemic (Lax et al., 2022). One such study, conducted in in April 2020 across 4 urban sites in the United States, found demonstrable increases in individual SDoH burden among low-income families due to the pandemic and its associated socioeconomic ramifications. Overall, 76.3% of individuals assessed reported concerns about financial stability, 42.5% about their employment, 69.4% about availability of food, 49.5% about affordability of food, 31.0% about housing stability, and 35.9% about access to a clinic or physician (Sharma et al., 2020); these rates were significantly higher than those observed the year prior. Together, findings provide

evidence that the burden of SDoH has increased and led to further hardships among Americans throughout the COVID-19 pandemic (Drake & Rudowitz, 2022).

COVID-19 Related Stressors

In the context of infectious disease outbreaks such as the COVID-19 pandemic, a major way in which social determinants of health contribute to psychological outcomes is through increased risk for morbidity and mortality (for review see Chew et al., 2020). There are serious consequences associated with contracting the virus, including severe illness, long-term side effects, and increased risk for mortality, which can be termed COVID-19 stressors (Joshee et al., 2022). Both the experience of medical illness and concerns about infection or occurrence of health issues are significant sources of stress. Abundant research has shown strong associations between serious medical illness and psychological distress (for review see Thom et al., 2019). Likewise, findings show that individuals who were diagnosed with and experienced symptoms of COVID-19, and those who had loved ones die from COVID-19 infections or related causes, also experienced greater symptoms of depression, anxiety, and suicidal ideation (Kim et al., 2021; Yang et al., 2021).

Notably, the risk for COVID-19 infection and poor outcomes has not been equal among social groups as COVID-19 stressors are differentially impacted by pre-existing health status, baseline levels of poverty, social stress, and access to quality healthcare. The pandemic has exacerbated pre-existing health disparities experienced by members of traditionally marginalized or minoritized groups, including communities of color, immigrants, sexual and gender minority groups, and residents of lower socioeconomic status or racially segregated neighborhoods (Fortuna et al., 2020; Dalsania et al., 2022; Smout et al., 2022). Significant racial and economic disparities in the prevalence and

mortality rate of COVID-19 among groups across the U.S. have been documented (Acosta et al., 2021; Dalsania et al., 2021).

Demographic differences in COVID-19 outcomes are closely intertwined with the economic, environmental, and social circumstances within which people live. For example, in New York City, one of the earliest COVID-19 epicenters in the United States, COVID-19 testing accessibility was lowest and positivity rate was highest in neighborhoods marked by low socioeconomic status and by a greater proportion of non-white residents (Lieberman-Cribbin et al., 2020). Large-scale analyses of U.S. medical records have revealed strong associations between social determinants of health burden and COVID-19 infection (Lee et al., 2022) and mortality (Dalsania et al., 2021), such that geographic areas with the greatest SDoH burden (as indexed by county-level data such as percentage of uninsured residents, percentage of children born at a low birth weight, and percentage of adults who are current smokers) exhibited the highest COVID-19 mortality rates. These areas were also home to the highest proportion of Black and Hispanic residents, demonstrating the intertwined nature of SDoH and demographic health disparities and the ways in which structural racism is directly linked with health in the context of COVID-19 (Brondolo et al., 2023). Findings from recent longitudinal epidemiological studies have found overall causal links between greater community-level social determinants of health and COVID-19 illness, hospitalization, and death (Ali et al., 2023).

Due to increased economic strain, housing instability, and concerns about affording basic housing needs, food, and healthcare (Solomou & Constantinidou, 2020; Ryu & Fan, 2023; Bushman & Mehdipanah, 2022), diminished social support and interpersonal interactions (Etheridge & Spantig, 2022), and disproportionate infection

and mortality rates, members of communities historically burdened by social determinants of health have faced even greater disproportionate psychological burden associated with the pandemic (Novacek et al., 2020; Alegria et al., 2022; Khalatbari-Soltani et al., 2020; Rangel et al., 2020). Notably, stressors associated with the pandemic are fundamentally shaped by, and then further contribute to, social determinants of health in a recursive process; that is, individuals who live in the poorest of social and economic circumstances are most likely to 1) become sick or pass from COVID-19 and 2) lose their employment, health insurance, or social supports (i.e., become more burdened by SDoH), which in turn only increases their risk for poor COVID-19 outcomes, and - cumulatively - poorer psychological outcomes.

Effects of Social Determinants on Mental Health during the COVID-19 Pandemic

A growing body of research demonstrates continued support for the strong association between social determinants of health and mental health outcomes within the context of the COVID-19 pandemic. Research thus far has revealed that negative changes in various factors related to both community and individual SDoH stressors, including income, financial and interpersonal resources, and adverse changes in employment, have been linked to symptoms of anxiety, depression, and post-traumatic stress in both cross-sectional (Tull et al., 2020; Sherman et al., 2020) and longitudinal studies (Wanberg et al., 2020) conducted during the COVID-19 pandemic.

With regard to cross-sectional research, one large scale study of U.S. residents found that several stressors at the community/neighborhood level, including greater poverty and crime, were associated with poorer mental health outcomes (Yang et al., 2021). Another study that compared the impact of various domains subsumed under SDoH across 2020 and 2021 found that for both years, the variables most predictive of

depression included individual experiences of COVID-19 exposure and personal household income (Bakkeli, 2022). Being diagnosed or having symptoms of COVID-19 has also been associated with increased anxiety (Smout et al., 2022). In a Malaysian adult sample, individuals with lower education were more likely to report depression during the pandemic than those with higher education and individuals living alone were more likely to report depression than partnered individuals (Tan & Lee, 2022). Among transgender and gender diverse adults in the U.S., those who experienced changes in employment and housing at the beginning of the pandemic experienced greater levels of anxiety and depression than individuals without large shifts in their housing or employment circumstances (Smout et al., 2022). Similarly, other studies have found that experiences of interpersonal stress, including perceived discrimination and interpersonal safety concerns such as domestic violence, during the pandemic were also associated with poor mental health (Scoglio et al., 2023).

With regard to longitudinal research, one longitudinal cohort study conducted in the U.S. found that children facing the greatest social determinants of health such as food insecurity, parental unemployment, and disrupted mental health care treatment were most likely to show poorer mental health outcomes such as stress, sadness, and anxiety during the pandemic (Xiao et al., 2022). Similarly, among children and their families served by a community hospital in a low SES neighborhood in NYC, participants with food, housing, or legal needs had a significantly higher likelihood of having emotional or behavioral difficulties one year after the pandemic began (Lax et al., 2022). Finally, a longitudinal study of adults with pre-existing clinical diagnoses of anxiety and depression, social determinants of health impacted the trajectory of their illnesses during the pandemic in a number of ways: at a 20-week follow-up, individuals with higher food insecurity reported

higher depression and anxiety; individuals with higher insecurity about paying utilities reported higher anxiety; and difficulties accessing child care predicted slower improvement in depression symptomatology over time (Alegria et al., 2022). In examining socially-oriented domains of SDoH, one large-scale longitudinal analysis among German adults found that lack of social support and connectedness was predictive of depressive symptoms and anxiety over time during the pandemic (Reis et al., 2022). Together, these findings illustrate how socially determined factors contribute to differential psychological responses to the pandemic.

As community and individual SDoH are disproportionately distributed among demographic groups, it follows that the mental health fall-out of the COVID-19 pandemic would present differently depending on identity factors and group affiliations. Several studies have examined differences in mental health outcomes during the pandemic by characteristics such as gender, race, sexual orientation, age, education, relationship status, and geographic region of residence. Research has fairly consistently suggested that compared to cisgender men, cisgender woman and transgender individuals have experienced poorer mental health (Negri et al., 2023; Yang et al., 2021; Magalhaes et al., 2021; Smout et al., 2022). Compared to heterosexual individuals, sexual minorities including those who identify as lesbian, gay, and bisexual have similarly reported sharper declines in their mental health (Fish et al., 2021). With regard to racial/ethnic differences, studies have consistently found that People of Color (POC) have tended to exhibit poorer mental health outcomes, namely depression and anxiety, during the pandemic compared to white counterparts (Thomeer et al., 2023; Yang et al., 2021).

The majority of research has found age to be negatively correlated with depression and anxiety during the pandemic (Negri et al., 2023; Yang et al., 2021).

Research regarding relationship status has been similarly mixed, with some studies resulting that married individuals report greater distress (Magalhaes et al., 2021), some studies conversely indicating that single individuals exhibit greater distress (Negri et al., 2023), and tertiary research suggesting no significant role of relationship status in mental health during COVID-19 (Carotta et al., 2022). Likewise, findings with regard to educational status have been inconsistent, with some research suggesting no effects and other studies finding that having a bachelor's or master's degree was associated with poorer mental health (Yang et al., 2021; Magalhaes et al., 2021). Finally, some studies have suggested similar trends of depression or anxiety across geographic regions in the U.S. (Magalhaes et al., 2021), while others have found residents of the Northeast to have minimally worse mental health outcomes than residents of other American geographic areas, at least in the first year of the pandemic (Swaziek & Wozniak, 2020).

Psychological Processes Affected by SDoH and Subsequent COVID-19 Stressors

As a mass public health event, the COVID-19 pandemic has presented as an unpredictable and uncontrollable chronic stressor. The impact of such increases to psychosocial demands and decreases in the resources available to manage them can be understood within the psychosocial frameworks such as the transactional model of stress and coping. The transactional model indicates that the appraisal of an event as stressful occurs when environmental demands or threats outweigh psychological and material resources available (Lazarus & Folkman, 1984). Due to increasing financial strain and decreased social support (i.e., economic threats and depletion of resources occurring simultaneously) and disproportionate infection and mortality rates (i.e., heightened health threats), members of communities greatly burdened by social determinants of health are

at risk of experiencing high levels of stress during the pandemic (Novacek et al., 2020; Wanberg et al., 2020).

Conceptually, it is clear that basic-level needs such as shelter, nourishment, and support from others are needed to foster psychological needs, such as the ability to cope with stress (Maslow, 1943). However, approaches to coping often focus on the individual level and frame coping processes as either innate personality characteristics or individual choices readily amenable to simple intervention (Revenson & Lepore, 2012; Knoll et al., 2005). This focus on individual characteristics fails to consider the contextual or SDoH drivers of coping processes. This presumption is most clearly evident in the field of applied clinical psychology, where many traditional models of psychopathology focus overtly on the role of individual cognitions and behaviors in psychopathology and where evidence-based interventions rely on shaping thoughts and actions to enact psychological relief and growth.

Such lines of thinking have been reflected in research examining coping with the COVID-19 pandemic as well; for example one study limited its focus to examining relations between demographic characteristics and personality traits, such as agreeableness and openness to experience, with coping responses and their effectiveness in managing psychological distress, devoid of socioecological context (Volk et al., 2021). Though the focus on intrapersonal mechanisms has helped to establish clinical psychology as a scientific practice, it also often dismisses the impact of circumstances affecting patients outside of the therapy room. As such, integration of socioecological and biopsychosocial models into mental healthcare is warranted to improve efficacy of treatment.

The process of stress appraisal occurs in the context of environmental, social, and personal demands and resources. As such, it is critical to contextualize coping processes with consideration to biopsychosocial processes domains (Revenson & Lepore, 2012; Brondolo et al., 2016). Importantly, social determinants of health may meaningfully influence the selection of coping responses to stressors (Taylor & Stanton, 2007). One's range of potential coping responses may depend on past experiences, such as social stress (Brondolo et al., 2009) and on differential access to physical resources, such as food and nutrition, healthcare, and housing, and interpersonal or emotional resources, such as childcare, daily help with household tasks, and social support (Meyer et al., 2008; Matthews & Gallo, 2011). Across multiple domains of life stress, greater socially determined burden has been related to less effective coping (Ouwehand, et al. 2009; 2009; Brondolo et al., 2016).

Though researchers have called for coping to be contextualized as a process innately shaped by external factors, research is limited and empirical studies have typically constrained investigations to the influence of social support and socioeconomic status, in isolation (Revenson & Lepore, 2012). Likewise, the majority of clinically-oriented psychological research and intervention aimed at distress reduction, even in the context of the COVID-19 pandemic, has often framed coping as an innate, internal process, rather than behavioral choices shaped by one's context (Rettie & Daniels, 2021; Chew et al., 2020; Fullana et al., 2020).

Though the COVID-19 pandemic has placed unprecedented and meaningful demands on economic and social resources, research examining the role of SDoH in shaping coping processes and resulting mental health outcomes beyond prevalence rates for clinical disorders is limited. The extant research does suggest that financial instability

is associated with traditionally maladaptive coping behaviors such as substance use and behavioral disengagement (Park et al., 2020), whereas higher income is related to greater support-seeking behavior (Volk et al., 2021). However, other findings regarding the influence of socioeconomic status and SDoH on coping responses have been mixed (Ryff, 2022). There remains a need for a more comprehensive assessment of a broader range of SDoH in the context of the pandemic to better understand their consequences on psychological processes. Such knowledge could inform public health messaging regarding COVID-19 related mental health challenges and potentially influence public policy and institutional change targeting mental health disparities.

The Role of Meaning-Making in Psychological Adjustment to Stress

In the classic stress-and-coping framework, coping mediates the path of stress to distress or adjustment (Lazarus & Folkman, 1984). One aspect of coping and adjusting to stressors, particularly life events that make salient themes of mortality, are all-encompassing, or particularly uncontrollable, is the process of meaning-making. The meaning-making model of psychosocial adjustment to stressful life events was developed as an extension of the transactional model of stress to address psychological sequelae of stressful events or circumstances, such as cancer diagnoses and bereavement, that center issues of mortality and death (Park & Folkman, 1997; Park, 2013).

Meaning, writ-large, refers to one's beliefs and expectations about the world, others, and one's place in the world; one's goals or values for which they have motivation to move towards; and one's sense of purpose (Park, 2013). Meaning in life is shaped through prior experiences that create cognitive frameworks used to perceive, understand, and respond to occurrences in one's life (Fiske & Taylor, 1991; Park & Folkman, 1997). According to Park's meaning-making model of psychosocial adjustment to stress,

psychological distress occurs when one's general understanding of the world (i.e., global meaning) does not align with the meaning that is derived in a particular circumstance (i.e., situational meaning; Park, 2013). A discrepancy between global meaning and situational meaning can occur when an event is so stressful that it violates core beliefs about the world, sense of justice or safety, or one's identity.

Meaning-*making* refers to the process of reducing the discrepancy between global meaning and situational meaning. This process encompasses the tasks of making sense of a stressful life event, integrating the event into one's narrative of the world and meaning in life, and retaining or accordingly revising life goals within the context of the event (Park, 2013). As such, the goal of meaning-making is to reconcile situational meaning into the broader global meaning framework using an ongoing reappraisal process (Lazarus & Folkman 1984; Park & Folkman, 1997; Park, 2010). This intrapsychic cognitive-emotional process reduces distress (Park, 2013; Park, 2010).

Engaging continuously in searching for meaning without end can be understood as rumination and is associated with poorer adjustment, however arriving at meaning is associated with positive outcomes (Park, 2010). To this end, the meaning-making process is only helpful to the extent that there is eventually meaning *made* of the event, such that one's general beliefs about the world, goals and values, and sense of purpose globally become more closely aligned with these factors situationally (Park, 2010). A person has made meaning of a circumstance when they feel their situation makes sense, they achieve a state of acceptance, they feel they have personally grown, they are able to integrate their experience into their self-identity, they may reevaluate the sequelae of the event as having some positive implications, and they have restored their sense of meaning and purpose in life (Park, 2013). At large, having a coherent sense of how the world works,

being able to identify important goals/values for oneself, and having a sense of purpose for one's life have been associated with better physical and mental health (Park, 2013).

The meaning-making model was originally developed to understand stressful life events encompassing loss and grief such as bereavement (Park, 2008; Holland et al., 2006) and miscarriage (Nikčević & Nicolaides, 2014). This approach was adopted as a frame to understand psychosocial adjustment to various health conditions. Health issues can pose a serious threat to one's meaning in life. Serious illness can violate one's understanding of themselves, beliefs about how the world works, beliefs regarding sense of justice and safety, and personal goals for the future. Psychosocial adjustment to illness requires engagement in meaning-making to reduce discrepancies between global meaning and illness-specific meaning. Studies have examined meaning-making in patients with chronic pain (Ferreira-Valente et al., 2021), cancer (Loeffler et al., 2018), diabetes (Barone et al., 2019), HIV (Courtenay, 1998), and cardiovascular disease (Krok & Zarzycka, 2020). Research has shown that among individuals diagnosed with various serious health conditions, engaging in meaning-making processes and eventually being able to have meaning made of their illness is associated with better psychological outcomes (Park, 2013).

Importantly, the model has also been previously applied to larger scale population-wide events such as the 9/11 World Trade Center attacks (Ai et al., 2005; Park et al., 2012), and natural disasters (Maffly-Kipp et al., 2020; Park, 2016). In these traumatic contexts, people have been found to make meaning of the events by reconnecting with or establishing new priorities and values (e.g., family, charity, social integration), developing a deeper sense of identity and life goals aligned with new values, and synthesizing a new narrative where the event has some sort of poignant positive

impact such as bringing the community together. Across these contexts, meaning-made was found to mediate the relation between stress exposure and psychological outcomes (Park, 2016). As such, the meaning-making model may be particularly well-equipped to understand the psychological distress experienced during the COVID-19 pandemic due to the coalescing socioeconomic stressors resulting from the pandemic (Ryff, 2022), the disturbances to almost all forms of routine in daily life that usually provide meaning in life (Castigloni & Gaj, 2020), the grief associated with increased exposure to illness and bereavement (Milman et al., 2020; Bertuccio & Runion, 2020), and the innate lack of controllability and certainty about the pandemic (Freeston et al., 2020; Park et al., 2020; Park, 2016).

Meaning Made of the COVID-19 Pandemic

Meaning-making during COVID-19 is both a personal and societal issue (Ryff, 2022). Making sense of the world again in extremely stressful, uncertain, and uncontrollable circumstances is an essential human function. However, one's *ability* to make meaning of any given situation does not equate to one's *capacity*. Meaning-making is a demanding process that requires cognitive effort, emotional resources, and time. Individuals who are appreciably burdened by social determinants of health, and who spend a significant portion of energy on managing daily stressors and acquiring basic needs, may not have sufficient intrapsychic capacity to engage in meaning-making (Ryff, 2022). One participant in a quantitative study conducted by Sandbakken & Moss (2021) about meaning-making during COVID-19 aptly reflected the ways in which external circumstances can contribute to differential experiences in trying to make meaning of the pandemic:

> I called a colleague that I keep in touch with, and said, 'I'm sitting here and all of a sudden I have a lot of spare time, so I thought it would be nice to catch up.' And he said, 'wow, really, you have a lot of time?' Then he told me that, 'I'm sorry, I'd love to catch up, but not now. Because, you see, my wife is a nurse, I'm a labour union representative, and my children...' He has small children, and has to try to get them through their school days. 'So I'm sorry.' And then I realised that I have to be humble here – realise where I am. (p. 11)

Thus far, the meaning-making model has been successfully applied to explain the psychological consequences resulting from COVID-19 stress among various groups. One qualitative study of African immigrants living in the U.S., a marginalized group, provided detailed data on meaning-making processes as a way of coping with the COVID-19 pandemic (Ekwonye & Truong, 2021). Findings revealed that participants perceived the pandemic as a significant stressor threatening their sense of global meaning, which initiated meaning-making processes consisting of attempts to shift situational meaning (e.g., focusing on the positives, cognitive reframing, and engaging in downward social comparisons) and global meaning (e.g., re-evaluating meaning and purpose in life, positively re-appraising the effect of the pandemic on their lives). Together, these attempts eventually led to meaning being made, marked by accepting the circumstances, focusing more on appreciating life circumstances, and experiencing positive personal growth. One participant stated: "I used this opportunity to re-evaluate my life, re-evaluate my priorities . . . to evaluate what I'm doing, and look deeply into my own life. I now understand that nobody can make me happy except me" (p. 90), reflecting a process of

re-evaluating values and growing as a person. Another participant, showcasing a new-found value of community, remarked:

> The value of physical and face-to-face human contact is now very important to me. I am more aware of guarding my health and prize good health more. I have a heightened sense of hygiene and healthy habits. The human responsibility of being our brother's keeper by protecting one another, for example, by wearing masks during this pandemic, is also very important to me. (p. 92)

Similar themes emerged in a qualitative study conducted with adults in Norway (Sandbakken & Moss, 2021). In particular, participants in this study relied heavily on the notion of the pandemic being a communal, rather than individual, stressor to make meaning of and psychologically adjust to their circumstances.

Quantitatively, one longitudinal study, administered at three time points from October 2019 to May 2020 to college students in China, found that individuals who initially described themselves as more able to find meaning in negative events before the pandemic exhibited lower levels of depression and anxiety during the pandemic compared to individuals who less frequently engaged in meaning-making (Yang et al., 2021). These results suggest that one's capacity to make meaning of stressful or traumatic circumstances buffer against psychological distress during the pandemic. Findings from an online survey of U.S. residents in the second month of the pandemic similarly provided further evidence for the meaning-making model of psychological adjustment to stressful life events; individuals who were experienced greater meaning made of the COVID-19 pandemic had lower scores on clinical measures of anxiety and depressive

symptoms compared to individuals who struggled to make meaning of the pandemic (Milman, 2020).

The study conducted by Milman and colleagues (2020) also provided evidence for a mediational model in which the association between individual stressors (i.e., both COVID-19 stressors including personal experiences of diagnosis or death of a loved one and social determinants of health stressors including employment, housing, and financial difficulties) and increased depression and anxiety was mediated through decreased meaning made of the pandemic. In a more recent study that sought to replicate this work, Negri and colleagues (2023) found that meaning-making did not function as a mediator for any of the relations between stressor variables and psychological distress in a sample of Italian (vs. American) participants, suggesting potential cultural differences in stress attribution and adjustment processes.

However, it is notable that in both the analyses of Milman and colleagues (2020) and Negri and colleagues (2023), each stressor was tested independently as a predictor, and variables were never combined into total scores to assess the impact of cumulative burden. More broadly, no theoretical considerations were made about the potential differences between underlying social determinants of health burdens or burden related to personal experiences with the COVID-19 disease. These choices limit ability to draw conclusions about the cumulative and differential effects of these different types of burdens. Further, the role of geographic/community stressors were not examined. Additionally, although both studies controlled for the influence of demographic variables (and found that these variables did uniquely predict psychological distress in hierarchical regression analyses), they did not report on the discrete effects of these variables on

meaning-making, rendering it unclear how the process of making meaning may vary based on unique identity characteristics.

Despite calls to examine the effects of poverty and other forms of environmental, structural, or social stressors (i.e., social determinants of health) on meaning-making and integrating this into clinical care (Bell et al., 2015; Evans et al., 2017), current research remains limited. In the context of COVID-19 in particular, cumulative evaluation using multiple indicators of both individual and community-level SDoH burden would be important in identifying the types of converging determinants that put individuals at greatest risk of COVID-19 stressor exposure and resulting difficulties in psychological adjustment. To fully understand emerging mental health disparities in the ongoing public health crisis, it is critical to empirically evaluate the influence of social determinants on COVID-19 stress exposure, meaning-making processes, and mental health outcomes. Such investigations could provide much-needed insight on how to adapt and shape clinical interventions for individuals belonging to populations most at-risk for long-term psychological distress. As such, the current study seeks to examine the relations between social determinants of health burden, COVID-19 stressor exposure, meaning-made of the pandemic, and subsequent anxiety and depressive symptoms within a nationally representative sample of U.S. adults. Specifically, this study seeks to empirically evaluate the supposition that social determinants of health fundamentally shape experiences with COVID-19, which in turn hamper psychological processes needed for adjustment, and undermine psychological well-being.

The Current Study

The aim of the current study is to understand the factors that undermine intrapsychic capacity to adjust to the COVID-19 pandemic by making meaning of the

circumstances, and examine how this pathway may contribute to risk of poor mental health outcomes. Specifically, this study will assess the relation of both individual-level and community-level variables reflecting social determinants of health burden and COVID-19 burden on psychological processes and outcomes. The four focal constructs of this study are: social determinants of health (SDoH) burden (as indexed by individual burden and community burden), COVID-19 burden (as indexed by individual burden and community burden), meaning made of the pandemic, and psychological distress (as indexed by depression and anxiety).

Hypotheses

1. We expect that there will be differences in the main study variables of SDoH burden, COVID-19 burden, meaning-making, and psychological distress based on demographic characteristics (i.e., age, gender, race, ethnicity, sexual orientation, relationship status, geographic region, and educational attainment).
2. We hypothesize that greater individual and community SDoH burden, and greater individual and community COVID-19 burden, will be associated with lower meaning made of the pandemic.
3. Additionally, greater individual and community SDoH burden, and greater individual and community COVID-19 burden, will be related to increased depression and anxiety.
4. We propose a final model in which there is a direct positive effect of social determinants of health (SDoH) on psychological distress, which operates indirectly through the sequential mediators of COVID-19 stress exposure and meaning-made of the pandemic. Specifically, greater SDoH burden will be positively correlated with COVID-19 related stressors, which will in turn be

associated with lower meaning making of the pandemic (i.e., poorer integration of events and sense of footing in the world). Difficulties in making meaning of the pandemic, in turn, will be related to more symptoms of depression and anxiety. Inclusion of individual and community burden variables and configuration of variables within the path model will be guided by results of prior analyses examining lower-level hypotheses.

METHODS

Participants and Recruitment

This study utilized a correlational survey design to examine pathways linking social determinants of health and COVID-19 stressor exposure to psychological processes and outcomes experienced during the pandemic. All survey responses (n = 572) were gathered in December, 2020. The study was approved by the Institutional Review Board of St. John's University, IRB protocol number FY2021-209.

Centiment, an online survey research participant recruitment platform, was used to recruit a nationally representative (U.S.A.) self-selected sample of adult participants. Centiment users are recruited via many outlets, including various social media sites such as Facebook and LinkedIn, and first verified by Centiment to ensure quality responses. Recruitment was conducted to obtain a nationally representative sample based on four criteria: race and Hispanic/Latino ethnicity, gender, age range, and geographic location of residence (i.e., Southeast, Midwest, Northeast, West, and Southwest). Eligibility criteria included being at least 18 years of age, residing in the United States, and ability to read and write in English at a level required to complete the survey.

Once the survey was launched on Centiment, Centiment users were informed that they qualified for a new survey through either an alert on their dashboard, via email, or through push notifications. Only the estimated length of the survey (15 minutes) and compensation amount, but not the title or content of the survey, was presented to potential participants to avoid selection bias. Interested participants were then redirected to the survey, housed on Qualtrics, and were first required to provide consent and to complete a CAPTCHA for security purposes. The first items on the survey asked participants to report on the four pieces of demographic information (race and

Hispanic/Latino ethnicity, gender, age range, and geographic location of residence) that were used to stratify participants into a nationally representative sample. U.S. census-matched quotas for each of these variables were created to track the proportion of participants meeting each quota. Once a participant endorsed a characteristic of a specific quota that had already been met, that participant was immediately redirected back to Centiment and informed that they did not qualify for this study.

The survey took approximately 15 minutes to complete. Participants were asked to answer questions about themselves (including basic socio-demographic information and medical and mental health conditions), their access to various resources, their personal experiences with and perceptions of COVID-19, their coping strategies and levels of psychological distress, and their adherence to COVID-19 health behavior guidelines. After answering all the items in the survey, participants were presented a "Thank You" page on Qualtrics, which included a brief message thanking participants for their time and provided a list of resources such as organizations aimed at alleviating housing and food insecurity and providing mental health care access. See Appendix for survey materials.

Participants were instructed to click through to the next page in order to fully complete the survey and be compensated by Centiment. Compensation consisted of a small monetary amount determined by Centiment to be a fair compensation for a 15-minute survey and was distributed directly by Centiment via PayPal. Participants were informed in the consent form that they would receive compensation in the amount they agreed to when they entered the survey through Centiment.

Several security measures were taken to manage risks associated with online data recruitment. First, Centiment leveraged IP verification to ensure all participants reside in

the U.S.. Similarly, metadata restrictions were implemented within Qualtrics such that only users within the U.S. were able to access the survey. Additionally, five criteria were used to identify quality survey responses eligible for compensation. Potential participants were informed on the consent page that responses suspected of not being completed in good faith or suspected of fraud would not be compensated.

With regard to criteria indexing quality survey responses, participant surveys were deemed low-quality and were rejected if they: were completed too quickly (i.e., in less than approximately 50% of the average time of completion), reflected straight-lining (responding the same way to each survey item), included a response in the final, open-text question suspect of copy-and-pasting, met other criteria indicative of fraud as evaluated by Centiment, or failed both of the attention checks embedded as items in the survey. Participants who failed both attention checks were automatically redirected to Centiment at that point in time, where they were informed that they had been disqualified from the survey. These participants were denied the opportunity to complete the rest of the survey and were not compensated. Likewise, participants who completed the survey too quickly, engaged in straight-lining, included open-text responses suspect of copy-and-pasting, or whose responses met any either criteria indicative of fraud by Centiment's standards were not compensated and were removed from the final sample.

A total of 572 participants completed the study, met criteria for good-faith responses, and were compensated. Six-hundred and ninety-one individuals began the survey. However, 119 of these individuals did not complete the survey because they identified with a demographic characteristic whose quota was already met, failed both attention checks, left the survey prematurely, or were otherwise identified as producing

potentially fraudulent responses by Centiment. These individuals did not receive compensation and were not included in the final sample.

Measures

Social Determinants of Health Burden

Self-reported individual social determinants of health were assessed using a modified version of the Accountable Health Communities (AHC) Health-Related Social Needs (HRSN) Screening tool (Centers for Medicare & Medicaid Services, 2018; Billioux et al., 2017). The HRSN screening tool was developed to assess levels of material deprivation and burden due to social determinants of health, primarily in clinical or medical settings. The tool was developed using questions taken from validated scales assessing various domains of socially determined health factors (Centers for Medicare & Medicaid Services, 2018).

The original HRSN screening tool consists of 26 items encompassing 5 core domains (housing instability, food insecurity, transportation, utility help needs, interpersonal safety) and 8 supplemental domains (financial strain, employment, family/community support, education, physical activity, substance use, mental health, disabilities) reflecting social determinants of health. For this study, the original screening tool was modified so that across domains, items assessed long-term levels of need or threat over the past 12 months (e.g., “In the past 12 months, which of the following best describes your living situation?”). A 12-month period was chosen to manage concerns of temporality reflected in the hypotheses. Some items from the original screener were removed as they overlapped with questions and constructs featured elsewhere in the study’s survey (e.g., items assessing mental health symptoms) or due to concerns about

the survey's length and participant burden. The modified measure also included one item assessing exposure to racial/ethnic interpersonal discrimination. The final measure assessing individual social determinants of health featured 12 items addressing the domains of: health insurance, employment, housing stability, ability to afford basic housing utilities, financial access to medical care, food security, ADL/IADL support needs, racial/ethnic discrimination, interpersonal violence within the home, alcohol use, illicit drug use, and cigarette use. Responses to each item were assessed using Likert or dichotomous yes/no response scales (based on the format of the question), with higher numbered items corresponding to greater burden. Responses to the twelve items were z-scored and then summed to create a total individual social determinants of health (SDoH) burden score for each participant (a = .86). Higher scores indicate greater individual SDoH burden.

Community-level exposure to social determinants of health were assessed through zip-code level data from the 2020 American Communities Survey. Geocoding procedures outlined by the Public Health Disparities Geocoding Project at Harvard University (Testa et al., 2022) were utilized. The R package "tidycensus" was used to access the Census Data Application Program Interface (API) to match and extract community level information matched to each participant's reported zip-code. This data includes several available indexes of social determinants of health for the year 2020: the percentage of the zip-code population living in poverty, the percentage of the zip-code population living in crowded households, and an Index of Concentration at the Extremes for White, non-Hispanic high-income households vs. Persons of Color low-income households. The Index of Concentration at the Extremes variable was first reverse-coded to match the

directionality of the other two variables; then the three variables were z-scored and then summed to create a total community SDoH burden score for each participant (a = .71).

COVID-19 Burden

Individual COVID-19 stressors were assessed via eight items inquiring about personal experiences with COVID-19. These items inquired about perceived risk of becoming infected with COVID-19 (response scale: low vs. moderate-high), perceived risk of poor outcomes if infected with COVID-19 (response scale: low vs. moderate-high), personal experience of ever having symptoms or ever being diagnosed (both response scales: yes or no), personal experience of being treated for COVID-19 (response scale: no vs. outpatient treatment or hospitalization), living with family members or others who are high-risk for poor COVID-19 outcomes (yes or no), and incidence of a loved one being diagnosed with COVID-19 or dying from COVID-19 (both response scales: yes or no). Responses to the eight items were summed to create a total individual COVID-19 burden score for each participant (a = .71). Higher scores indicate greater total individual COVID-19 burden.

Community-level exposure to stressors associated with the COVID-19 pandemic was assessed through zip-code level data from the 2020 American Communities Survey. We used geocoding procedures outlined by the Public Health Disparities Geocoding Project at Harvard University (Testa et al., 2022). The R package "tidycensus" was used to access the Census Data Application Program Interface (API) to match and extract community level information about COVID-19 incidence and mortality matched to each participant's reported zip-code. This data includes COVID-19 cases and COVID-19 deaths per 1000 residents in the month of December 2020. These two variables were z-

scored and then summed to create a total community COVID-19 burden score for each participant, with higher scores indicating greater community COVID-19 burden (a = .87).

Meaning-Making

Meaning made of the COVID-19 pandemic was assessed using the Integration of Stressful Life Experiences Scale (ISLES; Holland et al., 2010). The ISLES is a brief six-item scale that evaluates the degree to which an individual has adaptively integrated a stressful life experience into their broader life narrative, which reflects having made meaning of the event. The scale consists of two subscales, each containing three-items. One subscale assesses comprehensibility, or one's sense of understanding of the life stressor. The other subscale assesses footing in the world, or one's experience in finding or redefining one's values, identity, and place in the world in light of the life stressor. The measure in this study asked participants to reflect on the extent to which they agree or disagree with each of the six statements with regard to COVID-19, and included items such as "this event is incomprehensible to me" (comprehensibility) and "since this event happened, I don't know where to go next in my life" (footing in the world). Responses were recorded on a 5-point Likert scale, with responses ranging from 1 = Strongly disagree to 5 = Strongly agree. Responses to all six items were reverse-coded and then summed into a total score (a = .89), such that higher scores indicate greater meaning-made of the pandemic. Total scores for the two subscales were also calculated using the same method (comprehensibility subscale a = .83; footing in the world subscale a = .89).

Psychological Distress

Psychological distress was assessed via brief self-report measures of anxiety and depression. Depressive symptoms experienced over the past two weeks were measured using the 2-item Patient Health Questionnaire (PHQ-2; Kroenke et al., 2003). To indicate

experienced frequency of the two symptoms of depression, responses were recorded on a 4-point Likert scale (0=not at all, 4=nearly every day). Scores for the two items were summed to create a total depression score (a = .86). Similarly, anxiety symptoms experienced over the past two weeks were evaluated using the 2-item Generalized Anxiety Disorder Questionnaire (GAD-2; Kroenke et al., 2007). To indicate experienced frequency of the two symptoms of generalized anxiety, responses were recorded on a 4-point Likert scale (0=not at all, 4=nearly every day). Scores for the two items were summed to create a total anxiety score (a = .88).

Data Analyses

All analyses were conducted using SPSS Version 23, 2017. Preliminary analyses were conducted to investigate demographic differences in the main study variables (individual SDoH burden and COVID-19 burden, community SDoH burden and COVID-19 burden, total meaning-making and the subscales of comprehensibility and footing in the world, depression, and anxiety) according to age, gender, race and ethnicity, sexual orientation, geographic region, and educational attainment. Next, hierarchical regressions were used to identify and isolate those demographic and main study variables significantly linked to psychological processes and outcomes to be utilized in final model construction and hypothesis testing. Primary hypothesis testing involved mediation and moderation analyses to examine pathways between SDoH and COVID-19 burden, meaning-making variables, and psychological distress. To test final hypotheses, analyses were conducted using the PROCESS macro using protocols recommended by Hayes (2022). This method approximates coefficients using percentile bootstrapping. As there is tendency for the distribution of indirect effects to be non-normal, bootstrapping methodology, which does not assume a normal sampling distribution, is preferable

(Edwards & Lambert, 2007; MacKinnon et al., 2004). Variables in the models were standardized.

As a first step in data analyses, variables were examined for missing data and outliers suggestive of measurement error. No such indications of measurement error were found. There was minimal missing data across individual, self-report variables. There were sixty participants who did not provide their zip codes, which inhibited extraction of community-level variables (i.e., Index of Concentration at the Extremes, poverty, crowding, COVID-19 infection rate, COVID-19 mortality rate) for these participants. All missing data at the variable level was coded as -999. A missing values analysis using Little's MCAR test was not significant χ^2 17.29, DF = 36, p = .996, indicating that there is no evidence to suggest that the data were not MCAR. Listwise deletion of cases containing any missing values was used for all analyses as is inherent to bootstrapping methodology.

All analyses were conducted using bootstrapping with 10,000 iterations. As a methodology, bootstrapping does not assume a normal sampling distribution in the way that is necessary for parametric tests. This feature is particularly relevant to the current dataset, which includes several variables (as depicted in Table 1) that do not meet typical assumptions of normality necessary for parametric tests. Process analyses using the PROCESS macro automatically utilizes bootstrapping methodology. To retain consistency across analyses, bootstrapping was also warranted in conducting lower-order analyses to correct for statistical bias in examination of potential sociodemographic differences in the data. We argue that the skewed distribution of some of the main study variables reflects real information about the conditions participants experience; that is, we would not assume a normal distribution of poverty, crowding, or COVID-19 infection

and death rates, within the U.S. population, even under perfect sampling conditions. As such, transforming such variables to adhere to a normal distribution would obfuscate true, meaningful variance within the data.

RESULTS

Characteristics of the Sample

In total, 572 participants were recruited. Table 2 provides demographic information for the sample. Participants ranged in age from 18 to 92 years old (M = 46, SD = 19.01). Fifty-four percent of all participants self-identified as women. Most participants identified as White (77%) or Black (14%) and, independent of race, 16% of participants identified as Hispanic. With regard to sexual orientation, the majority of participants (87%) identified as straight/heterosexual; approximately 56% of the sample reported being partnered (with or without legal status). All participants reported residing in the United States, with 23% living in the Midwest, 21% in the Northeast, 31% in the Southeast, 11% in the Southwest, and 15% in the West. With regard to individual socioeconomic status, the greatest proportion of the sample (27%) reported an annual household income of less than $25,000 and 44% reported attaining a college or vocational degree or higher.

Table 1 presents the descriptive characteristics of all main study variables: individual SDoH burden and COVID-19 burden, community SDoH burden and COVID-19 burden, meaning-made of the pandemic (including subscales of comprehensibility and footing in the world), depression, and anxiety. Table 3 shows the distribution of participants' responses to each of the twelve items contributing to the total individual SDoH burden score. Table 4 shows the distribution of participants' responses to each of the eight items contributing to the total individual COVID-19 burden score. See Table 5 for the descriptive statistics of the five geocoded variables subsumed under the main study variables of community SDoH burden and community COVID-19 burden.

Using the standard clinical cut-off score of 3 to delineate individuals with symptoms of depression and anxiety indicative of a clinical diagnosis (Kroenke et al., 2001), approximately one-third of the sample reported symptoms of clinical depression (30.2%) and clinical anxiety (34.3%). Using the cut-off of 20 on the Integration of Stressful Life Events Scale (ISLES) as established by Holland (2010), over half (53.2%) of participants struggled substantially to make meaning of the pandemic.

Preliminary Analyses of Sociodemographic Variations in Social Determinants of Health, COVID-19 Stressors, Meaning-Making, and Psychological Distress

Variations by Age

Bivariate zero-order correlations were conducted to examine the association between age and the main study variables. As shown in Table 6, age was negatively correlated with total individual social determinants of health burden and total individual COVID-19 burden, such that older participants reported less burden. With regard to community-level factors, age was associated negatively with community COVID-19 burden but not community social determinants of health burden. Age was positively correlated with total meaning-made of the pandemic, as well as the two subscales of comprehensibility and footing in the world independently, such that older participants endorsed greater meaning made of the pandemic. Finally, age was negatively correlated with both depression and anxiety.

Variations by Gender

An independent-samples t-test was conducted to examine gender differences in the main study variables. As shown in Table 7, there were no differences between women and men in individual total social determinants of health burden or total individual

COVID-19 burden. Similarly, there were no gender differences in community social determinants of health burden or COVID-19 burden. With regard to meaning-making, men reported greater total meaning-made of the pandemic compared to women. Likewise, men reported greater scores on the subscales of comprehensibility and footing in the world than women. Women reported significantly more depressive symptoms and anxiety compared to men.

Variations by Race and Ethnicity

To assess differences in the main study variables by racial group, an independent-samples t-test was performed. Due to the relatively small size of participants identifying as Asian, American Indian and Alaska Native, Native Hawaiian and Pacific Islander, and Multiracial, all individuals identifying as non-White were combined into the category of "Persons of Color" (POC). As seen in Table 8, there were no significant differences in individual total social determinants of health burden or individual total COVID-19 burden between white and POC participants. POC participants had greater community-level social determinant of health burden than white participants, but no differences in community-level COVID-19 burden were found. Finally, no racial differences in meaning-making (at the full scale or subscale level), depression, or anxiety were observed.

Additionally, an independent-samples t-test was conducted to examine differences in study variables between participants identifying as Hispanic/Latino(a) vs. those who did not. Results are shown in Table 9. Hispanic/Latino(a) participants reported greater individual total social determinant of health burden and COVID-19 burden compared to non-Hispanic/Latino(a) participants. Similarly, Hispanic/Latino(a) participants had

greater community-level social determinants of health burden and COVID-19 burden. Non-Hispanic/Latino(a) participants reported having made greater total meaning of the pandemic compared to those who identified as Hispanic/Latino(a); on a subscale level there were no ethnicity differences in comprehensibility, however there were in footing in world with non-Hispanic/Latino(a) participants scoring higher than Hispanic/Latino(a) participants. With regard to psychological distress, Hispanic/Latino(a) participants also endorsed higher levels of depression and anxiety than non-Hispanic/Latino(a) participants.

Variations by Relationship Status

An independent-samples t-test was conducted to examine differences in the main study variables by relationship status (single vs. partnered). Results are shown in Table 10. There was no effect of relationship status on individual social determinants of health burden; however there was a significant difference in individual COVID-19 burden such that partnered participants reported more individual exposure to COVID-19 stressors than single participants. Similarly, no differences were found in community-level social determinants of health burden by relationship status but there was a significant difference in community-level COVID-19 burden such that partnered participants were exposed to greater community COVID-19 burden than single participants. However, no differences were found in total meaning-making (nor the subscales), nor in depression or anxiety, between partnered and unpartnered participants.

Variations by Sexual Orientation

An independent-samples t-test was conducted to examine differences in the main study variables by sexual orientation. Due to the relatively small size of participants

identifying with various non-heterosexual orientations (i.e., Lesbian, Gay, Bisexual, Pansexual, and Asexual), these participants were combined into one category of LGBQA-identified. As shown in Table 11, there was a significant difference in individual social determinants of health burden between straight/heterosexual participants and LGBQA participants, with LGBQA participants reporting more total burden. There was no difference in individual COVID-19 burden between groups. Likewise, there was no difference in community-level social determinants of health burden or COVID-19 burden between groups. With regard to meaning-making, straight/heterosexual participants reported greater total meaning-made than LGBQA participants; specifically, straight/heterosexual participants reported greater footing in the world than LGBQA participants though no differences in comprehensibility were observed. LGBQA participants also reported more depression and anxiety than straight/heterosexual participants.

Variations by Geographic Region

To assess for differences in the main study variables by geographic region, a one-way MANOVA was performed. There was a statistically significant difference in the main study variables based on geographic region, $F\ (32, 1827.07) = 7.99$, $p < .001$, Wilk's $\Lambda = 0.62$, partial $\eta^2 = .11$. Post-hoc adjusted univariate tests using Bonferroni's procedure were conducted to examine differences between pairs of geographic groups. The results of post-hoc pairwise comparisons are presented in Table 12.

A statistically significant difference in total individual social determinants of health burden by region was found, $F\ (4, 164.27) = 2.79$, $p = .03$; partial $\eta^2 = .02$, though no pairwise comparisons between geographic groups emerged as significant. There was

also a statistically significant difference in total individual COVID-19 burden based on geographic region, F (4, 9.50) = 2.53, p = 0.4; partial η^2 = .02. Northeastern participants reported significantly more individual COVID-19 burden than Southeastern participants (p = .04, 95% CI [0.02, 1.48]), but no other pairwise differences were found. With regard to community-level variables, a statistically significant difference in community social determinants of health burden was observed, F (4, 77.01) = 15.59, p < .001; partial η^2 = .11. In pairwise comparisons, Southwestern participants reported significantly more community social determinants of health burden than Midwestern (p < .001, 95% CI [1.05, 3.04]) and Northeastern participants (p = .03, 95% CI [0.32, 2.42]); Southeastern participants reported significantly more community social determinants of health burden than Midwestern (p < .001, 95% CI [0.84, 2.36]) and Northeastern participants (p = .20, 95% CI [0.88, 1.76]); similarly, Western participants reported significantly more community social determinants of health burden than Midwestern (p < .001, 95% CI [1.05, 2.86]) and Northeastern participants (p = .002, 95% CI [0.30, 2.24]). Likewise, there was a statistically significant difference in community-level COVID-19 burden based on geographic region, F (4, 94.28) = 33.29, p < .001; partial η^2 = .21. In pairwise comparisons, Northeastern participants reported significantly more community COVID-19 burden than Midwestern (p < .001, 95% CI [1.42, 2.77]), Southeastern (p < .001, 95% CI [1.66, 2.93]), Southwestern (p < .001, 95% CI [1.09, 2.68]), and Western participants (p = .01, 95% CI [0.12, 1.59]) and Western participants reported more burden than Midwestern (p < .001, 95% CI [0.56, 1.93]), Southeastern (p < .001, 95% CI [0.80, 2.09]), and Southwestern participants (p = .003, 95% CI [0.22, 1.83]). There was a significant effect of geographic region on total meaning-making, F (4, 99.64) = 2.86, p =

.02; partial η^2 = .02. In pairwise comparisons, Northeastern participants reported less total meaning-made of the pandemic than both Midwestern (p = .04, 95% CI [-4.82, -0.10]) and Southeastern participants (p < .05, 95% CI [-4.47, -0.03]). On a subscale-level, no geographic differences were observed in comprehensibility, F (4, 13.04) = 1.32, p = .26; partial η^2 = .01. However, there was a statistically significant difference in footing in world based on geographic region, F (4, 44.20) = 3.97, p = .004; partial η^2 = .03. In pairwise comparisons, Northeastern participants reported less footing in world than both Midwestern (p = .01, 95% CI [-2.89, -0.22]) and Southeastern participants (p = .004, 95% CI [-2.85, -0.34]). With regard to psychological distress, no geographic differences were found in depression, F (4, 7.11) = 2.07, p = .08; partial η^2 = .02, or anxiety, F (4,8.82) = 2.26, p = .06; partial η^2 = .02.

Variations by Educational Attainment

To assess for differences in the main study variables by educational attainment, a one-way MANOVA was performed. There was a statistically significant difference in the main study variables based on educational attainment, F (32, 1827.07) = 5.27, p < .001, Wilk's Λ = 0.72, partial η^2 = .08. Post-hoc adjusted univariate tests using Bonferroni's procedure were conducted to examine differences between pairs of geographic groups. The results of post-hoc pairwise comparisons are presented in Table 13.

A statistically significant difference in total individual social determinants of health burden by educational level was found, F (4, 362.96) = 6.34, p < .001; partial η^2 = .05. Pairwise comparisons revealed that participants with graduate or professional degrees reported significantly greater individual social determinant of health burden compared to those with a high school diploma/GED (p = .01, 95% CI [1.50, 8.56]), those

with some college (p = .002, 95% CI [1.12, 8.21]), and those with a college graduate or vocational degree (p < .001, 95% CI [2.58, 9.41]). Likewise, a statistically significant difference in total individual COVID-19 burden by educational level was found, F (4, 23.97) = 6.57, p < .001; partial η^2 = .05. Similarly, participants with graduate or professional degrees reported significantly greater individual social COVID-19 burden compared to those with a high school diploma/GED (p < .001, 95% CI [0.63, 2.41]), those with some college (p = .01, 95% CI [0.13, 1.92]), and those with a college graduate or vocational degree (p = .002, 95% CI [0.28, 2.01]). No differences were found in community-level social determinants of health burden by educational attainment F (4, 7.47) = 1.36, p = .25; partial η^2 = .01. However, there was a significant effect of education on community-level COVID-19 burden, F (4, 78.75) = 26.64, p < .001; partial η^2 = .18. Pairwise comparisons revealed that participants with graduate or professional degrees lived in areas with more COVID-19 burden than those with no high school degrees, (p < .001, 95% CI [0.90, 3.92]), those with a high school diploma/GED (p < .001, 95% CI [1.95, 3.55]), those with some college (p < .001, 95% CI [1.90, 3.51]), and those with a college graduate or vocational degree (p < .001, 95% CI [1.42, 2.98]). There were no differences in total meaning-made of the pandemic F (4, 76.30) = 2.18, p = .22; partial η^2 = .01, nor in the subscale of comprehensibility F (4, 14.22) = 1.45, p = .22; partial η^2 = .02, nor in the subscale of footing in the world F (4, 24.83) = 2.20, p = .07; partial η^2 = .02. There was a statistically significant difference in depression based on educational attainment, F (4, 19.75) = 5.91, p < .001; partial η^2 = .05. The only significant pairwise difference that emerged was that participants with graduate or professional degrees reported greater symptoms of depression than those with college or

vocational degrees ($p < .001$, 95% CI [0.39, 2.04]). Similarly, there was a statistically significant difference in anxiety based on educational attainment F (4, 28.39) = 7.57, $p <$ .001; partial $\eta^2 = .06$. Participants with college or vocational degrees reported less anxiety than those without high school degrees ($p = .004$, 95% CI [-3.67, -0.41]), those with some college ($p = .008$, 95% CI [-1.38, -0.13]), and those with graduate or professional degrees ($p < .001$, 95% CI [-2.18, -0.43]).

Associations among Main Study Variables

Bivariate zero-order correlational analyses were conducted to investigate relations among the main variables of interest: individual social determinant of health burden, individual COVID-19 burden, community-level social determinants of health burden, community-level COVID-19 burden, meaning-making (total score the two subscales of comprehensibility and meaning-in-world), and psychological distress (depression and anxiety). Results of these analyses are presented in Table 14.

First, correlations between SDoH and COVID-19 burden variables were examined within levels and across levels. Individual SDoH burden was not significantly associated with community SDoH burden. There was a significant, moderate, positive correlation between individual SDoH burden and individual COVID-19 burden. Additionally, a significant, weak, positive correlation between individual SDoH burden and community COVID-19 burden was found. Individual COVID-19 burden was not significantly correlated with community COVID-19 burden; however, there was a significant, weak, positive correlation between individual COVID-19 burden and community SDoH burden. Community SDoH burden was significantly, weakly, positively correlated with community COVID-19 burden.

Next, correlations among variables pertaining to psychological processes (i.e., meaning-making) and psychological outcomes (i.e., depression, anxiety) were evaluated. The variables of total meaning-making and its two subscales of comprehensibility and footing in the world were all significantly, strongly, positively correlated. Total meaning-making was significantly, negatively correlated with depression and anxiety, although the strength of the association varied by subscale. There was a significant, strong, positive correlation between depression and anxiety.

Third, the associations between individual burden variables and psychological variables were examined. Individual SDoH burden was significantly, moderately, negatively correlated with total meaning-making, as well as the two subscales of comprehensibility and footing in the world. Individual SDoH burden was also significantly, moderately, positively correlated with both depression and anxiety. Likewise, individual COVID-19 burden was significantly, moderately, negatively correlated with meaning-making (and its two subscales) and significantly, moderately, positively correlated with depression and anxiety.

Finally, the associations between community burden variables and psychological variables were evaluated. Community SDoH burden was significantly, weakly, negatively associated with total meaning-making and the footing in the world subscale but not with comprehensibility. There was no significant correlation between community SDoH burden and depression or anxiety. Community COVID-19 burden was significantly, weakly, negatively correlated with meaning-making and both subscales, and significantly, weakly, positively correlated with depression and anxiety.

Predictors of Meaning-Making Processes

Prior to primary hypotheses testing with path analyses, hierarchical regression was performed to first examine and establish factors influencing total meaning made of the pandemic. Demographic variables were entered into the first block. These variables included age, gender, race, ethnicity, sexual orientation, relationship status, geographic region (dummy-coded with Southeast as the reference group), and educational attainment (dummy-coded with college/vocational degree as the reference group). Individual-level burden variables (i.e., individual SDoH burden and individual COVID-19 burden) were entered into the second block. Community-level burden variables (i.e., community SDoH burden and community COVID-19 burden) were entered into the third block. Demographic variables were entered into the first block in order to control for the potential impact of sociodemographic characteristics on the hypothesized main effects of individual and community burden variables on dependent, psychological variables. Individual burden variables were entered before community-level variables because 1) empirically, stronger correlations emerged between individual burden factors and meaning-making variables in correlational analyses and 2) theoretically, stressors directly experienced by the self were assumed to have more of a relation with intrapsychic processes.

Results of hierarchical regression analysis predicting total meaning-making are shown in Table 15 (model summaries) and Table 16 (coefficients for discrete variables). The first model was significant with demographic characteristics alone accounting for 11% of the variance in meaning made of the pandemic ($p < .001$). When examining the unique effects of each demographic variable, only older age had a significant relation

with greater meaning made of the pandemic. The second model, which included the addition of individual burden variables, contributed to significantly more total variance in the dependent variable ($p < .001$); namely, 32% of total meaning made of the pandemic was accounted for by this model. In Model 2, both lower individual SDoH burden and lower individual COVID-19 burden were uniquely associated with greater meaning made of the pandemic; with regard to demographic variables, only identifying as a man (but no longer older age) had a significant relation with greater meaning-making. The third model, which contained community burden variables as additional predictors, did not significantly increase overall variance in meaning made of the pandemic ($p = .07$). In this model, lower individual SDoH burden and lower individual COVID-19 burden, as well as identifying as a man, maintained their associations with greater meaning-making; however, no significant relations between community SDoH burden or community COVID-19 and meaning-making were found.

Predictors of Depression and Anxiety

As a next step, hierarchical regression analyses were also performed to examine and establish factors influencing depression and anxiety, prior to conducting final path analyses. Similar to the hierarchical analyses where meaning-making was the outcome, demographic variables were entered into the first block, individual burden variables were entered into the second block, and community burden variables were entered into the third block. Additionally, total meaning made of the pandemic was entered into the fourth block.

Results of hierarchical regression analyses predicting depression are shown in Table 17 (model summaries) and Table 18 (coefficients for discrete variables). The first

model was significant, as demographic characteristics accounted for 19% of the variance in depression ($p < .001$). When examining the unique effects of each demographic variable, younger age and identifying as LGBQA were significantly associated with greater depression. The second model, which included the addition of individual burden variables, contributed to significantly more total variance in the dependent variable ($p < .001$); specifically, 36% of depression could be accounted for by this model. In this model, only individual greater SDoH burden, but not individual COVID-19 burden, was uniquely associated with greater depression. With regard to demographic variables, only younger age maintained a significant relation with depression. The third model, which contained community burden variables as additional predictors, did not significantly increase overall variance depression ($p = .90$). In this model, greater individual SDoH burden and younger age maintained their associations with depression, though no significant relations between community SDoH burden or community COVID-19 to depression were observed. However, the fourth model, which included total meaning made of the pandemic as an additional predictor, contributed to significantly more total variance in the dependent variable ($p < .001$), with 37% of depression accounted for by this model. In this final model, less meaning made of the pandemic was significantly associated with greater depression, and younger age and greater individual SDoH burden maintained their associations with depression as well.

Results of hierarchical regression analyses predicting anxiety are shown in Table 19 (model summaries) and Table 20 (coefficients for discrete variables). The first model was significant with demographic characteristics accounting for 24% of the variance in anxiety ($p < .001$). When examining the unique effects of each demographic variable,

younger age, Hispanic/Latino identity, and not attaining a high school diploma or GED were significantly associated with greater anxiety. The second model, which included the addition of individual burden variables, contributed to significantly more total variance in the dependent variable ($p < .001$); results indicate that 39% of the variance in anxiety could be accounted for by this model. In this model, only greater individual SDoH burden, but not individual COVID-19 burden, was uniquely related with greater anxiety. With regard to demographic variables, older age and not attaining a high school diploma retained significant relations with increased anxiety, but Hispanic/Latino identity did not; additionally, a significant relation emerged between identifying as a woman and increased anxiety. The third model, which contained community burden variables as additional predictors, did not significantly increase overall variance in anxiety ($p = .98$). In this model, greater individual SDoH burden, younger age, identifying as a woman, and not attaining a high school diploma retained their significant effects on anxiety, though no significant relations between community SDoH burden or community COVID-19 and anxiety were observed. The fourth model, which included total meaning made of the pandemic as an additional predictor, contributed to significantly more total variance in the dependent variable ($p < .001$), accounting for 40% of the variance in anxiety. In this final model, less meaning made of the pandemic was significantly associated with greater anxiety, and age, identifying as a woman, and not attaining a high school diploma maintained their associations with anxiety as well.

Mediation and Moderation Analyses

Final path models encapsulating all salient study variables were constructed and tested to understand how SDoH and COVID burden contribute to psychological

processes and outcomes. Results of the prior hierarchical regression analyses predicting meaning-making, depression, and anxiety were used to inform which variables to include in subsequent path analyses. As prior analyses indicated that individual burden variables are significantly associated with meaning-making and psychological distress, while community burden variables are not, only individual burden variables, but not community burden variables, were included in primary path models. Age and gender were included as covariates in the models due to prior analyses suggesting they may be associated with meaning-making and distress outcomes above and beyond the effects of individual SDoH burden and COVID-19 burden.

My proposed model hypothesized a serial mediation in which SDoH burden is the independent variable, COVID-19 burden is the first mediator, meaning made of the pandemic is the second mediator, and depression and anxiety are the outcome variables. I expected that greater SDoH burden will be associated with greater COVID-19 burden, which in turn will be related to lower meaning-making, which will in turn be associated with greater depression and anxiety. Indirect, direct, and total effects were examined via two separate serial mediation models, with one model utilizing depression as the outcome and the other model featuring anxiety as the outcome. As a final step, alternate models examined whether meaning-making and psychological distress may be better explained by other frameworks incorporating moderation effects.

Hypothesized Models: Serial Mediation Analyses

All paths of the first proposed serial mediation model predicting depression are shown in Figure 1. First, the model examined whether the relation between individual SDoH burden and depression was mediated by individual COVID-19 burden alone. The

standardized specific indirect effect for this pathway was not significant (a_1b_1 = .04, *SE* = .02; 95% CI = -.01, .08). Second, the model tested whether the relation between individual SDoH burden was mediated by meaning-making alone; this standardized indirect effect was significant (a_2b_2 = .09, *SE* = .02; 95% CI = .05, .13). The serial indirect effect was significant ($a_1a_3b_2$ = .02, SE = .07; 95% CI: .01, .03). The direct effect of individual SDoH burden on depression, removing the influence of the mediators and the covariates, was also significant (*c*' = .07, SE = .01; 95% CI: .05, .10). This model accounted for 36% of the variance in depressive symptoms, R^2 = .36, *F* (5, 546) = 61.94, $p < .001$.

All paths for the second proposed serial mediation model predicting anxiety are shown in Figure 2. The pathway representing the sole, standardized indirect effect of COVID-19 burden in the relation between individual SDoH burden and anxiety was not significant (a_1b_1 = .01, *SE* = .02; 95% CI = -.03, .06). The pathway representing the sole, standardized indirect effect of meaning-making was significant (a_2b_2 = .09, *SE* = .02; 95% CI = .05, .14). The serial indirect effect was significant ($a_1a_3b_2$ = .02, SE = .01; 95% CI: .01, .04). The direct effect of individual SDoH burden on anxiety, removing the influence of the mediators and the covariates, was also significant (*c*' = .08, SE = .01; 95% CI: .06, .11). This model accounted for 39% of the variance in anxiety, R^2 = .39, *F* (5, 546) = 68.64, $p < .001$.

Alternate Models: Conditional Process Analyses

Alternate models were tested to examine different configurations of the main study variables in their potential to predict depression and anxiety. A model was constructed in which individual COVID-19 burden is the independent variable,

psychological distress outcomes are the dependent variables, meaning-making is the sole mediator for the association between the independent and psychological distress, individual SDoH burden is the moderator of the relationship between COVID-19 burden and meaning-making, and gender and age operate as covariates. This model emphasizes the role of individual COVID-19 experiences on psychological processes regarding the pandemic and psychological outcomes. It posits that increased individual COVID-19 burden contributes to lower meaning made of the pandemic, and that individual SDoH burden modulates this relationship such that in the presence of increased SDoH burden, the negative association between COVID-19 burden and meaning-making amplifies; in turn, these processes are linked with increased psychological distress.

Results of the first moderated mediation model, using depression as an outcome, are shown in Figure 3. Both individual COVID-19 burden (B = -.38, SE = .13, t = -2.81, p = .002, 95% CI: -.64, -.11) and individual SDoH burden (B = -.21, SE = .06, t = -3.70, p = .002, 95% CI: -.31, -.10) were negatively related to meaning made of the pandemic. A significant interaction effect of individual COVID-19 burden by individual SDoH burden on meaning-making was found (B = -.03, SE = .01, t = -2.46, p = .01, 95% CI = -.05, -.01). Specifically, the relation of higher individual COVID-19 burden to lower meaning-making was only significant when individual SDoH was high (1 SD above the mean, effect = -.60, SE = .14, p < .001, 95% CI = -.87, -.33). Lower meaning made of the pandemic was associated with increased depression (B = -.07, SE = .01, t = -5.49, p < .001, 95% CI = -.10, -.05). Likewise, greater individual SDoH burden was associated with increased depression (B = .09, SE = .02, t = 4.94, p < .001, 95% CI: .05, .12) However, individual SDoH burden did not moderate the association between individual

COVID-19 burden and depression (*B* = -.003, SE = .004, *t* = -0.82, *p* = .41, 95% CI = -.01, .01). The full conditional process model was supported by the index of moderated mediation, (*B* = .002, SE = .001, 95% CI = .001, .004), indicating a conditional indirect effect such that the relation between increased individual COVID-19 burden and higher depression occurs through lower meaning made of the pandemic only when individual SDoH burden is high (*B* = .04, SE = .01, 95% CI: .02, .07). In sum, this moderated mediation model explained 36% of the variance in depression, R^2 = .36, *F* (6, 545) = 51.70, *p* < .001.

Results of the second moderated mediation model, using anxiety as an outcome, are shown in Figure 4. As previously reported, both individual COVID-19 burden (*B* = -.38, SE = .13, *t* = -2.81, *p* = .002, 95% CI: -.64, -.11) and individual SDoH burden (*B* = -.21, SE = .06, *t* = -3.70, *p* = .002, 95% CI: -.31, -.10) were negatively related to meaning made of the pandemic. The relation of individual COVID-19 burden to meaning-making was moderated by individual SDoH burden (*B* = -.03, SE = .01, *t* = -2.46, *p* = .01, 95% CI = -.05, -.01), such that higher individual COVID-19 burden was associated with lower meaning made of the pandemic only when individual SDoH was high (1 SD above the mean, effect = -.60, SE = .14, *p* < .001, 95% CI = -.87, -.33). Lower meaning made of the pandemic was associated with increased anxiety (*B* = -.08, SE = .01, *t* = -5.87, *p* < .001, 95% CI = -.11, -.05). Likewise, greater individual SDoH burden was associated with increased anxiety (*B* = .10, SE = .02, *t* = 5.65, *p* < .001, 95% CI: .07, .14). However, no interaction effect of meaning-making by individual SDoH was found; individual SDoH burden did not moderate the association between individual COVID-19 burden and anxiety (*B* = -.003, SE = .004, *t* = -0.82, *p* = .41, 95% CI = -.01, .01). The full moderated

mediation model was supported with the index of moderated mediation, (B = .002, SE = .001, 95% CI = .001, .004), indicating a conditional indirect effect such that the relation between increased individual COVID-19 burden and higher anxiety occurs through lower meaning made of the pandemic only when individual SDoH burden is high (B = .05, SE = .01, 95% CI: .02, .08). In sum, this model explained 38% of the variance in anxiety, R^2 = .38, F (6, 545) = 57.62, p < .001.

DISCUSSION

The primary goal motivating this research was to understand the factors that are related to capacity to make meaning of the COVID-19 pandemic, as this was a main intrapsychic process hypothesized to contribute to psychological health. To do so, we utilized a stepwise approach to first identify and isolate variables with the greatest impact on the psychological process of meaning-making and on the outcomes of depression and anxiety, and then built and tested mechanistic models linking individual SDoH and COVID-19 burden to meaning made of the pandemic and psychological distress. As hypothesized, we found support for a serial mediation model in which the relation between greater individual social determinants of health (SDoH) burden and elevated psychological distress was mediated through greater individual COVID-19 burden and poorer meaning made of the pandemic. An alternate conditional process model in which COVID-19 burden acted as the primary predictor of psychological distress, meaning-making maintained its role as an intrapsychic mechanism, and SDoH burden was conceptualized as a moderator of the relation between COVID-10 burden and meaning-making, was also statistically sound. However, in this alternate model, the relation of COVID-19 burden to meaning-making was only significant when SDoH burden was high, clarifying that it is ultimately SDoH burden that seems to preeminently shape the effect of COVID-19 experiences on meaning-making and distress. Overall, our findings suggest that 1) social determinants of health experienced on an individual level are a driving force in shaping psychological processes and outcomes during the COVID-19 pandemic and that 2) meaning-making is an important intrapsychic mechanism underlying the connection between external stressors and psychological distress.

Mental Health during the COVID-19 Pandemic: The Impact of External Burdens

In this non-clinical sample of 572 American adults, roughly one out of every three participants reported symptoms concerning for clinical depression and anxiety. This statistic is consistent with rates of depression and anxiety found in prior research documenting stark population increases in depression and anxiety from the standard pre-2020 baseline, and highlights the secondary mental health crisis associated with the COVID-19 pandemic (McKnight-Eily, 2021; Vahratian et al., 2021; Bakkeli, 2022).

One of the most robust findings of this study is that, above all other factors measured, the *individual burden* of social determinants of health appears to be closely associated with symptoms of depression and anxiety, consistent with our hypothesis and relevant literature (Bakkeli, 2022; Tan & Lee, 2022; Smout et al., 2022; Reis et al., 2022; Ma et al., 2022; Scoglio et al., 2023; Xiao et al., 2022; Lax et al., 2022; Alegria et al., 2022). Socioecological models of health have posited complex, cascading effects of societal and interpersonal factors on individual mental health (Bronfenbrenner, 1979). Prior research conducted during the COVID-19 pandemic has linked various aspects of social determinants, experienced at the individual and community level, to psychological well-being (Tull et al., 2020; Sherman et al., 2020; Wanberg et al., 2020). However, this is one of the few studies to examine the *cumulative* effect of a wide range of individual, self-reported health related social needs (vs. single domains such as social connectedness, financial stability, or unemployment) on mental health during the pandemic and contrast these effects against those of community variables (Lax et al., 2022; Xiao et al., 2022; Smout et al., 2022; Reis et al., 2022).

One way in which individual social determinants of health may contribute to poorer mental health outcomes in the context of the pandemic may be through individual COVID-19 stressors. Consistent with prior research elucidating the ways in which social and economic inequities are tied with COVID-19 health disparities, our findings indicated that individual SDoH burden is positively correlated with individual COVID-19 burden (Dalsania et al., 2021; Lee et al., 2022). In turn, the cumulative burden of perceiving oneself as high risk, having personal experiences of illness, and encountering family members become sick or die, is tied with psychological distress, as hypothesized (Kim et al., 2021). Notably, though COVID-19 emerged a mass public health event and posed a threat to communities at large, the findings of this study suggest that it is personal stressors related to COVID-19 illness (rather than the experience of living in a neighborhood heavily impacted by COVID-19) that are closely linked with depression and anxiety, at least during the first year of the pandemic.

Meaning-Making as an Intrapsychic Mediator

A central focus of this work was to examine the potential mechanistic role of meaning-making in the relation between external burdens and psychological health during the pandemic. As hypothesized, SDoH burden and COVID-19 burden were linked with total meaning made of the pandemic. When all burden variables were examined simultaneously in one model, both greater individual SDoH burden and COVID-19 burden were associated with poorer meaning made of the pandemic. These results suggest that the cumulative burden of personal stressors associated with social determinants of health (e.g., housing instability, food insecurity, unemployment, limited access to medical care, interpersonal conflict, racial discrimination, health behaviors) and

COVID-19 (e.g., perceptions of personal risk, experiences of illness, and experiences of loved ones dying from COVID-19) affect coping response and disrupt meaning-making processes, consistent with prior research (Park 2013; Ryff 2022; Sandbakken & Moss, 2021; Brondolo et al., 2009; Ekwonye & Truong, 2021).

It is important to clarify that people burdened by health-related social needs, or those with low socioeconomic status, do not have less ability to make meaning of stressful circumstances (Ryff, 2022). Meaning-making is a universal intrapsychic process that has been examined cross-culturally (Park, 2013). *Ability* to make-meaning of stressful circumstances should not be conflated with *capacity*, which is what we contend is affected by external burdens.

In the full serial mediation model, lower total meaning made of the pandemic was associated with both increased anxiety and depression, as hypothesized. This finding is consistent with the larger literature on meaning-making, which posits that when uncontrollable and unpredictable events (particularly those that evoke issues of mortality) are difficult to synthesize into one's life narrative and disrupt one's sense of footing in the world, an internal conflict is created, which can manifest in psychological distress (Freeston et al., 2020; Park 2022; Park, 2016; Milman, 2020).

More broadly, the results of this study corroborate and extend prior research conducted during COVID-19 on the mechanistic role of meaning-making in psychological adjustment (Milman et al., 2020; Negri et al., 2023). If extrapolated as a long-term process, findings suggest that individual SDoH burden may increase risk for COVID-19 burden, which in turn undermines capacity to make meaning of the pandemic, and consequently drives symptoms of depression and anxiety. These models hold even

when controlling for gender and age, two sociodemographic characteristics that appear uniquely linked to psychological factors. In contrast to other research, this study is novel in that it examined the cumulative and differential effects of both individual and community burdens on intrapsychic processes and outcomes, bringing to light the cardinal impact of individual stressors. Importantly, the indirect effects of COVID-19 burden and meaning-making only partially mediated the link between SDoH burden and psychological distress, suggesting other intrapsychic or external factors may be at play underlying the pathway between personal SDoH burden and mental health outcomes.

Demographic Differences in Individual and Community Burden, Meaning-Making, and Mental Health Outcomes

As expected, notable differences in individual SDoH and COVID-19 burden, community SDoH and COVID-19 burden, meaning-making, and psychological distress among sociodemographic groups were found. Before discussing differences in psychological processes, it ought to be acknowledged that according to the results of hierarchical regression analyses predicting meaning-making and psychological distress, most sociodemographic differences may be accounted for by variations in SDoH and COVID-19 burden. That is, it is not that one's identity that increases risk for poorer psychological adjustment; rather it is the stressors associated with health-related social needs and COVID-19 experiences, which disproportionately impact certain groups, that appear to drive disrupted meaning making and resulting psychological distress.

With regard to social determinants of health, individual SDoH burden was associated with being younger, identifying as Hispanic/Latino(a), identifying as LGBQA, and having a graduate or professional degree. No differences in individual SDoH burden

by gender, race (POC vs. white), relationship status, or geographic region were found. Greater community SDoH burden was associated with being a POC and being from the West and Southwest. No differences in community SDoH burden by age, gender, relationship status, sexual orientation, or educational attainment were found. These findings present a mixed picture within the context of the greater literature, which suggests that on average, minoritized groups (along the lines of race, gender, sexual orientation, and education) tend to live in conditions more burdened by detrimental social determinants of health and themselves experience greater health related social needs (Lax et al., 2022; Drake & Rudowitz, 2022). However, in our sample, POC themselves did not report high individual SDoH burden (compared to white participants) despite experiencing greater community burden. Similarly, the finding that participants with graduate or professional degrees reported more individual SDoH burden but were not subject to particularly high community burden is somewhat perplexing, but may potentially be illustrative of the phenomenon of educated and otherwise privileged individuals experiencing economic hardships primarily related to job layoffs during the first year of the pandemic.

With regard to COVID-19 burden, younger age, identifying as Hispanic/Latino(a), being partnered in a relationship, residing in the Northeast, and having a graduate or professional degree (potentially because highly educated individuals in this sample may have also been more likely to work as healthcare workers) was linked with greater individual COVID-19 burden; no differences in gender, race, sexual orientation were found. Greater community COVID-19 burden was linked with being younger, identifying as Hispanic/Latino(a), being partnered in a relationship, being from

the Northeast, and having a graduate or professional degree; there were no differences by gender, race, or sexual orientation. These results also present somewhat of a mixed picture within the scope of other research examining the disproportionate impact of COVID-19 experiences on various social groups (Fortuna, 2020; Dalsania et al., 2021; Smout et al., 2022). One of the most consistent findings in the COVID-19 health disparities research has been that minoritized racial communities have experienced disproportionately high rates of COVID-19 infection and death (Dalsania et al., 2021); however, in this study we found only Hispanic/Latino(a) ethnicity, but not identification as a POC, to be associated with greater individual and community-level COVID-19 burden.

In examining demographic differences among psychological processes, we found lower meaning made of the pandemic to be associated with being younger, identifying as a woman, identifying as Hispanic/Latino(a), identifying as LGBQA, and residing in the Northeast; no differences by race, relationship status, or education. As prior studies examining meaning-making in the context of COVID-19 have not examined demographic differences, this finding is important and suggests that certain social groups may be at greater risk for disrupted meaning-making processes. Notably, once the effects of individual SDoH and COVID-19 burden were accounted for, only identifying as a woman retained association with lower meaning made of the pandemic; this suggests that additional factors not measured in the current models may be at play (e.g., socialization towards caretaking, unequal childcare or household responsibilities) in affecting women's capacity to ground themselves and make meaning of the events of the pandemic.

With regard to mental health outcomes, identifying as a woman, being Hispanic/Latino(a), and identifying as LGBQA was linked with greater depression and anxiety. This finding is consistent with prior research (Negri et al., 2023; Yang et al., 2021; Magalhaes et al., 2021; Smout et al., 2022; Fish et al., 2021; Thomeer et al., 2023) and provides further evidence of psychological vulnerability in these minoritized groups. Younger age was also related to higher psychological distress, adding to the literature that psychological resilience may improve with aging (Negri et al., 2023; Yang et al., 2021). Of note, once the effects of individual SDoH burden, individual COVID-19 burden, and meaning-made of the pandemic were accounted for, only younger age remained related to greater depressive symptoms and both younger age and identifying as a woman were related to elevated anxiety. These results suggest that there may be additional unique factors related to the external, interpersonal, or intrapsychic experiences of younger adults and women that have predisposed these individuals to psychological distress in the context of the pandemic.

Contrary to prior research (Thomeer et al., 2023; Yang et al., 2021), no differences in depression or anxiety were observed between participants identified as white and those who are POC. One explanation for this finding (as well as the lack of racial differences observed in COVID-19 burden) may be that due to small sizes of individuals belonging to minorized race groups in our sample, participants identifying as Black, Asian, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, and Multiracial were all collapsed into the category of POC; this decision may have obscured potential meaningful variations within these groups and contributed to an overall non-significant result. Additionally, we did not identify any differences in mental health

outcomes based on geographic region of residence or by relationship status, which contributes to the overall mixed prior findings in these domains (Magalhaes et al., 2021; Swaziek & Wozniak, 2020; Negri et al., 2023).

With regard to educational attainment, participants with graduate/professional degrees reported more depression and anxiety and those who did not complete high school reported more anxiety; this finding contributes to the mixed and inconsistent links between education and mental health in the context of the COVID-19 pandemic (Yang et al., 2021; Magalhaes et al., 2021). While the link between lower education and poorer mental health outcomes can be understood within the context of lower overall access to health-promoting resources and increased health related social needs, the heightened rates of depression and anxiety reported by highly educated individuals in this study is more confounding. One explanation may be that the highly educated participants in our sample were also more likely to be healthcare workers or other types of essential workers heavily burdened by COVID-19, particularly during the first year of the pandemic. Findings about the effects of educational attainment in particular should also be considered within sampling limitations; the number of participants who did not achieve a high school diploma/GED and those with a professional/graduate degree were much lower than those in the other three educational status groups, potentially contributing to statistical artifact that would be better evaluated with larger subgroup samples.

Clinical Implications

Several clinical implications can be drawn from the primary finding of this study that psychological distress is associated with increased individual social determinants of health burden, and that this relation is at least partially mediated by increased personal

COVID-19 burden and lower meaning-making. Foremost, results corroborate the stance that meaning-making is a powerful mechanism connecting the experience of stressful life circumstances such as the pandemic to resulting psychological distress. According to our results, one out of two adults experienced disrupted meaning-making, and this disjointed sense of meaning was associated with more severe anxiety and depressive symptoms. When mental health issues present within the context of such etiology, meaning-centered psychotherapies, which focus on helping patients reconnect with their sense of meaning and purpose in life, may be particularly helpful. These types of psychotherapies incorporate several facets and goals including assisting patients in clarifying core values, reconnecting with values-aligned activities, setting new life goals, cultivating mindfulness and acceptance, and considering the impact they want to leave on others and society (Montross Thomas et al., 2014; Martinez & Florez, 2015; Breitbart et al., 2022). Ultimately, such interventions can contribute to the synthesis of a more cohesive and empowering narrative of one's life that integrates the stressful life event, while deepening one's sense of identity and belonging in the world (Park, 2016; Martinez & Florez, 2015).

Compared to standard behavioral and cognitive strategies, psychotherapies that focus on meaning-making may be better equipped to address mental health concerns that emerge within the context of life events that are particularly unpredictable, uncontrollable, and directly confront the issue or mortality (Breitbart et al., 2022). Meaning-centered psychological interventions have been shown to be effective in managing symptoms of mood and anxiety disorder in various populations including individuals with chronic medical issues, those at the end of life, and those experiencing bereavement (Thomas et al., 2016; Breitbart et al., 2022). Presumably, meaning-centered

psychotherapies may be particularly powerful in managing the mental health fallout of the COVID-19 pandemic, which forced individuals to confront unpredictable mass illness and mortality. Such interventions, in which clinicians welcome exploration of the impact of loss in the context of personal and global COVID-19 experiences, could enable patients to better make sense of the pandemic, examine how their life trajectories may have been disrupted, and establish new goals that align with their life values. Though promising, clinical research on the efficacy of such interventions in the context of COVID-19 have not yet been published.

Just as mental health issues experienced in 2020 need to be contextualized within the larger scope of societal and environmental factors, so too does the process of psychotherapy need to take into account these effects. Findings of this study further confirm the need for thorough assessments of health-related social needs and COVID-19 experiences in mental health care settings (Marshall Lee et al., 2022). In building the trust needed in therapeutic relationships, mental health professionals must be mindful to explore and validate the real external burdens patients' face and the intense barriers these stressors can pose to mental health, as these factors significantly affect capacity to make meaning of stressful events. When working with populations with a high degree of socially determined burden, championing patients' concerns by facilitating connections with needed resources, such as referrals to housing assistance programs, providing support with applications for unemployment or SNAP benefits, and liaising with medical providers, is needed alongside more traditional inner-focused psychotherapy (Marshall Lee et al., 2022). To this end, community care, or working together collaboratively with others in one's social network to exchange support and uplift the larger community, may

be a particularly powerful and much-needed addition to individual psychotherapy or self-care (Bulmer et al., 2015; Robinson, 2020). Importantly, community care can have the dual benefit of bettering the structural and socioeconomic landscape of a given community while facilitating individual meaning-making through collective action and increased social connection, particularly among historically marginalized peoples (Bulmer, 2015; Robinson, 2020).

On a public health level, the impact of social determinants of health cannot be understated. Findings from this study may help guide public health messaging and community-level interventions aimed at mitigating the detrimental mental health effects of social determinants of health. Namely, findings provide evidence counter to the insidious narrative that mental health issues experienced during COVID-19 are solely tied to intrapsychic factors and personal choice (e.g., coping processes or personality features; Volk et al., 2021; Rettie & Daniels, 202; Chew et al., 2020; Fullana et al., 2020). Ultimately, bringing further awareness to the detrimental psychological effects of social determinants of health and reframing the discourse around the mental health fallout of the COVID-19 pandemic from an issue of personal responsibility to societal responsibility could strengthen calls to address health-related social needs and COVID-19 health disparities head-on through policy change (Khalatbari-Soltani et al., 2020; Rangel et al., 2020).

Limitations and Directions for Future Research

A primary limitation of this study is that the cross-sectional design constricts our ability to assess causal and temporal effects presented in the model. Longitudinal data would help distinguish how pathways among underlying individual social determinant of

health burden, individual COVID-19 burden, meaning-making, and mental health symptoms develop over time. Expanding on prior literature in the fields of meaning-making, stress and coping, and socioecological theory (Bronfenbrenner, 1979; Lazarus & Folkman, 1984; Maslow, 1943; Park & Folkman, 1997; Park, 2013) we hypothesize that both individual and community stressors associated with social determinants of health have cumulative, cascading effects on physical and mental health. However, the extent to which these stressors may contribute to diseases of despair (e.g., substance use, depressive disorders, suicide) that perpetuate underlying social inequities and health disparities in a bidirectional manner (i.e., they exacerbate each other over time) remains understudied (Ryff, 2022). Similarly, given much of the research examining meaning-making processes is correlational, the mechanistic role of reduced capacity to make meaning of the COVID-19 pandemic in these pathways warrants further study (Milman et al., 2020).

To this end, it is important to highlight that the findings of this study present only a single snapshot of psychological health during the COVID-19 pandemic. All data for this project were collected in December 2020, a month that marked the end of the first year of the pandemic and was also punctuated by the rollout of the first COVID-19 vaccines. Some longitudinal research investigating the mental health correlates of vaccination has suggested psychological distress declined after receiving the vaccine, particularly among individuals with greater health-related social needs (e.g., lower education, greater financial strain, occupations less flexible to work-from-home accommodations; Agrawal et al., 2021; Koltai et al., 2022, Chourpiliadis et al., 2023). There is some preliminary evidence to suggest that the improvement in mental health

following vaccination may operate - at least partially - by lowering perceived risk of infection and perceived severity of infection, variables that were subsumed under individual COVID-19 burden in our study (Koltai et al., 2022). However, other researchers have speculated that mental health improvements following vaccination may only be short-term (Chourpiliadis et al., 2023).

As such, future research would benefit from examining potential fluctuations in mental health over the past four year since the beginning of the pandemic, and how such fluctuations may have corresponded with changes in COVID-19 burden (i.e., advances in COVID-19 prevention and treatment, changes in public health mitigation efforts, and overall shifts in infection and mortality rates), alongside social determinants of health burdens. More specifically, it would be useful to understand how meaning-making is shaped by such longitudinal fluctuations in burden. For example, did invention and wide distribution of the COVID-19 vaccine increase meaning made of the pandemic, possibly as it marked a hopeful turn in the trajectory of the pandemic and alleviated some illness burden or as it highlighted the success of scientists, healthcare workers, and stakeholders to collaborate for humanitarian benefit? Were any of these effects sustained long-term or were they more temporary? Our findings suggest that individual social determinants of health are the paramount driver of psychological distress, partially through their effects on COVID-19 experiences, and therefore we may expect lasting detrimental consequences of underlying social determinants of health despite general improvement in COVID-19 burden; however, examination of such question would necessitate longitudinal data.

Another notable methodological consideration of this study relates to choice of measurement methodology. Prior literature has called attention to the inconsistencies in how social determinants of health are assessed and has underscored the lack of validated, comprehensive measurement tools for research settings (Billioux et al., 2017; Silva et al., 2016). Accordingly, in this study a clinically-based screening tool needed to be modified in order to evaluate a range of health-related social needs. Similarly, at the time of study launch, a validated measure of individual COVID-19 stressors had not yet been developed and therefore a set of researcher-created items reflecting personal experiences with COVID-19 illness and mortality were used to evaluate burden. Variations in response scales for items subsumed under individual total SDoH burden and COVID-19 burden scores may have contributed to measurement error. Since late 2020, a number of pandemic stressor scales have been developed and tested, which could be utilized in future research (Tambling et al., 2021; Lotzin et al., 2022).

The methodological decisions implemented to assess for individual and community-level SDoH and COVID-19 burdens in this study may have contributed to the surprising result that individual burden variables were not robustly (if at all) related to their community-level counterparts, and that by and large it was only personal burdens that were predictive of meaning-making, depression, and anxiety. This finding may further substantiate the notion that proxy measures of socioeconomic status, particularly indicators of aggregate neighborhood status, may not be adequate at capturing the full picture of the ways in which individuals differentially experience and are affected by the social conditions in which they live (Alegria et al., 2018; Billioux et al., 2017). However, it is also possible that this finding may be tapping into the construct of relative

deprivation, or the comparison of one's own resources and burdens to the general status of one's community.

Prior research has suggested that beyond individual or community SES, it is actually *relative* deprivation that drives mental and physical health disparities (Mishra & Carleton, 2015). Though it may be the case that within the context of the COVID-19 pandemic, personal stressors matter more in psychological adjustment than do community stressors, an alternative hypothesis would propose that individuals who are relatively deprived (in comparison to their communities) may be most at risk for disrupted meaning-making and distress. It would follow that individuals who are better-off than their neighbors, despite significant community burden, may fare better. This interpretation could explain some of the other unexpected demographic variations found in the current analyses, such as the result that racial identity was correlated with nearly none of the main study variables. However, in the absence of calculating relative deprivation and conducting specific analyses examining the associations of such a variable to meaning-making and psychological outcomes, conclusions cannot be drawn. Such explorations may be a fruitful avenue for future research.

Finally, though this study features a nationally representative sample along several strata including gender, race, age, and geographic region of residence, it is important to note the role of potential selection bias. Participants themselves decided whether they would like to register as Centiment users and complete surveys for compensation. As such, individuals who had ample time at home, who were less burdened by stressors related to work or childcare, and/or who had higher education, income, and access to technology may be overrepresented in the sample. Attempts were

made to curb some aspects of self-selection bias (e.g., by obscuring the topic/title of the survey from platform users on their dashboards) and protect against fraud (e.g., by implementing security and attention checks), however such concerns are notable. To this end, future research would warrant analysis of data from a much larger sample recruited through purer random sampling methods. A larger, population-based sample would also be more ideal in effectively examining geographic differences in geocoded and self-reported social determinants of health burden and COVID-19 burden, and their impacts on psychological processes and outcomes. To this end, the influences of other types of community stressors that were not featured in this study (e.g., noise pollution, air pollution, city walkability), but have been shown to be associated with other health-related social needs and mental health outcomes during the COVID-19 pandemic, could additionally be examined.

CONCLUSION

This study utilized a novel approach in examining the associations between individual and community-level social determinants of health (SDoH) and COVID-19 stressors on the capacity to make meaning of and psychologically adjust to the COVID-19 pandemic. We found support for a serial mediation model in which the association between individual SDoH burden and psychological distress operates through the variables of individual COVID-19 burden and meaning-making. Findings highlight the salient role of meaning-making in psychological adjustment and suggest that personal social determinants of health may fundamentally shape psychological processes and outcomes in the context of the pandemic.

Table 1

Descriptive Statistics for Main Study Variables

Variable	*N*	Min.	Max.	Mean (*SD*)	Skewness	Kurtosis
Individual SDoH Burden	569	-7.33	25.92	0.00 (7.58)	1.22	1.11
Individual COVID-19 Burden	572	0	8	2.40 (1.93)	0.88	0.60
Community SDoH Burden	512	-5.38	9.65	0.00 (2.39)	0.58	1.13
Community COVID-19 Burden	512	-0.99	5.47	0.00 (1.88)	2.28	3.66
Total Meaning-Making	571	6	30	20.26 (5.90)	-0.22	-0.30
Footing in the World	571	3	15	10.46 (3.37)	-0.30	-0.71
Comprehensibility	572	3	15	9.81 (3.12)	-0.04	-0.50
Depression	571	0	6	1.84 (1.87)	0.72	-0.56
Anxiety	571	0	6	1.93 (1.98)	0.71	-0.66

Table 2

Demographic Characteristics of the Sample

Characteristic	*n* (% of 572)
Gender	
Women	309 (54%)
Men	261 (45.6%)
Race	
White	443 (77.4%)
Black	79 (13.8%)
Asian	23 (4%)
American Indian and Alaska Native	16 (2.8%)
Multiracial	8 (1.4%)
Native Hawaiian and Pacific Islander	3 (0.5%)
Ethnicity	
Non-Hispanic/Latino(a)	479 (83.7%)
Hispanic/Latino(a)	93 (16.3%)
Sexual Orientation	
Straight/Heterosexual	500 (87.4%)
Bisexual or Pansexual	48 (8.4%)
Lesbian or Gay	14 (2.5%)
Asexual	7 (1.2%)
Relationship Status	
Partnered (with or without legal status)	321 (56.1%)
Single	158 (27.6%)
Divorced or Separated	63 (11%)
Widowed	30 (5.2%)
Annual Combined Income Range	
< $25,000	152 (26.6%)
$25,000 - $34,999	86 (15%)
$35,000 - $49,999	83 (14.5%)
$50,000 - $74,999	101 (17.7%)
$75,000 - $99,999	52 (9.1%)
$100,000 - $149,999	60 (10.5%)
> $150,000	37 (6.5%)
Education	
Did not attain high school diploma/GED	12 (2.1%)
Attained high school diploma/GED	152 (26.6%)
Some college or vocational school	153 (26.7%)
College or vocational degree	198 (34.6%)
Professional or graduate degree	56 (9.8%)
U.S. Region of Residence	
Southeast (e.g., FL, GA, VA)	175 (30.6%)
Midwest (e.g., IL, OH, MN)	130 (22.7%)

Northeast (e.g., NY, NJ, CT)	117 (20.5%)
West (e.g., CA, UT, AK)	86 (15%)
Southwest (e.g., TX, AZ, NM)	64 (11.2%)
Age (years)	
Mean (*SD*)	46.24 (19.01)

Note. Not all proportions may add up to 100% due to minimal missing data.

Table 3

Descriptive Statistics for Individual Social Determinants of Health Items

Variable	*n* (% of 572)
Health insurance: "Were you without insurance for any amount of time in the past 12 months?"	444 (77.6%)
No	128 (22.4%)
Yes	
Housing stability: "In the past 12 months, which of the following best describes your living situation?"	
"I have had a steady place to live"	458 (80.1%)
"I had a steady place to live, but was worried about losing it"	79 (13.8%)
"I did not have a steady place to live"	35 (6.1%)
Food security: "In the past 12 months, were you worried that your food would run out before you were able to get more?"	
"Never true"	301 (52.6%)
"Sometimes true"	203 (35.5%)
"Often true"	67 (11.7%)
Assistance with ADLs/IADLs: "Over the past 12 months, if for any reason you needed help with day-to-day activities such as bathing, preparing meals, shopping, managing finances, childcare, etc., were you getting the help you needed?"	
"I didn't need any help" OR "I got all the help I needed"	452 (79.0%)
"I could've used a little more help"	73 (12.8%)
"I needed a lot more help"	46 (8.0%)
Utilities: "In the past 12 months, has the electric, gas, oil, or water company threatened to shut off services in your home?	
No	454 (79.4%)
Yes	118 (20.6%)
Medical Care: "In the past 12 months, how difficult has it been for you to pay for medical care or mental health services?"	
"Not difficult at all"	373 (65.2%)
"Somewhat difficult"	120 (21.0%)
"Very difficult"	79 (13.8%)
Employment: "In the past 12 months, how difficult has it been for you to find or maintain employment?"	
"Not difficult at all"	345 (60.3%)
"Somewhat difficult"	123 (21.5%)
"Very difficult"	103 (18.0%)
Exposure to racial discrimination: "In the past 12 months, how often were you treated badly because of your race or ethnicity?"	

"Never"	399 (69.8%)
"Once or twice"	65 (11.4%)
"Sometimes"	71 (12.4%)
"Often"	17 (3.0%)
"Very often"	20 (3.5%)
Domestic violence: "In the past 12 months, how often have you felt unsafe or threatened by others in your home? That is, how often were you concerned that someone will physically hurt you, threaten to harm you, insult or talk down to you, or scream or curse at you?"	
"Never"	395 (69.1%)
"Rarely"	66 (11.5%)
"Sometimes"	57 (11.7%)
"Fairly often"	19 (3.3%)
"Frequently"	25 (4.4%)
Alcohol consumption: "How many times in the past 12 months have you had 5 or more drinks in a day (males) or 4 or more drinks in a day (females)?"	
"Never"	341 (59.6%)
"Once or twice"	114 (19.9%)
"Monthly"	51 (8.9%)
"Weekly"	34 (5.9%)
"Daily or almost daily"	32 (5.6%)
Smoking: "How many times in the past 12 months have you smoked cigarettes, cigars, or marijuana?	
"Never"	307 (53.7%)
"Once or twice"	60 (10.5%)
"Monthly"	38 (6.6%)
"Weekly"	32 (5.6%)
"Daily or almost daily"	135 (23.6%)
Illicit drugs: "How many times in the past 12 months have you used illegal drugs for non-medical reasons?"	
"Never"	440 (76.9%)
"Once or twice"	41 (7.2%)
"Monthly"	40 (7.0%)
"Weekly"	21 (3.7%)
"Daily or almost daily"	30 (5.2%)

Table 4

Descriptive Statistics for Individual COVID-19 Items

Variable	*n* (% of 572)
Infection risk: "What do you think your chances are of contracting COVID-19?"	
"Low"	242 (42.3%)
"Moderate" or "High"	330 (57.7%)
Poor outcome risk: "Do you consider yourself "high risk" for COVID-19 outcomes? How would you rate your level of risk?"	
"Low Risk"	238 (41.6%)
"Moderate Risk" or "High Risk"	334 (58.4%)
High-risk family members: "Do you have family members or live in a household with individuals who are "high risk" for poor COVID-19 outcomes?	
"No"	356 (62.2%)
"Yes"	216 (37.8%)
Loved ones with COVID-19: "Have any of your loved ones been diagnosed with, or been suspected of having, COVID-19?"	
"No"	408 (71.3%)
"Yes"	216 (37.8%)
Loved ones died of COVID-19: "Have any of your loved ones passed of COVID-19?"	
"No"	507 (88.6%)
"Yes"	65 (11.4%)
COVID-19 symptoms: "In the past year, have you experienced symptoms similar to those of COVID-19?"	
"No"	414 (72.4%)
"Yes"	158 (27.6%)
COVID-19 positive: "Have you ever tested positive for COVID-19?"	
"No"	519 (90.7%)
"Yes"	53 (9.3%)
COVID-19 treatment: "Have you ever received COVID-19 treatment?"	
"No"	522 (91.3%)
"Yes, I received outpatient treatment" or "I was hospitalized"	50 (8.7%)

Table 5

Descriptive Statistics for Geocoded Community SDoH and COVID-19 Items

Variable	*N*	Min.	Max.	Mean (*SD*)	Skewness	Kurtosis
Community SDoH Burden						
Index of Concentration at the Extremes	512	-0.30	0.42	0.12 (0.13)	-0.35	0.69
% Poverty	512	0.03	0.38	0.15 (0.05)	0.74	1.52
% Crowded Households	512	0.00	0.12	0.03 (0.03)	1.68	2.36
Community COVID-19 Burden						
COVID-19 Infection Rate (Cases per 1000)	512	0.15	770.92	97.40 (174.79)	2.51	5.92
COVID-19 Mortality Rate (Deaths per 1000)	512	.00	25.14	2.70 (6.29)	2.96	7.61

Table 6

Correlations between Age and Main Study Variables

Variable	Age
Individual SDoH Burden	-.44** [-.50, -.37]
Individual COVID-19 Burden	-.13* [-.21, -.05]
Community SDoH Burden	-.09 [-.18, .00]
Community COVID-19 Burden	-.13* [-.19, -.06]
Total Meaning-Making	.28** [.20, .35]
Comprehensibility	.15* [.06, .23]
Footing in the World	.35** [.28, .42]
Depression	-.39** [-.46, -.31]
Anxiety	-.42** [-.49, -.35]

Note. Values in square brackets indicate the BCa 95% confidence interval for each correlation.

** $p < .001$
* $p < .05$

Table 7

Gender Differences in Main Study Variables

Variable	Women *M (SD)* *n* = 272	Men *M (SD)* *n* = 233	*t*	*df*	*p*	Cohen's *d*	BCa 95% CI
Individual SDoH Burden	0.40 (7.14)	0.17 (8.39)	0.33	458.04	.75	0.03	-1.17, 1.55
Individual COVID-19 Burden	0.04 (0.97)	-0.04 (1.06)	0.81	503	.43	0.08	-0.11, -0.25
Community SDoH Burden	0.05 (2.41)	-0.06 (1.28)	0.52	503	.62	0.06	-0.32, 0.51
Community COVID-19 Burden	-0.11 (1.78)	0.15 (2.01)	-1.54	466.38	.13	0.14	-.58, 0.62
Total Meaning-Making	19.35 (5.81)	21.02 (5.60)	-3.18	503	.001*	0.29	-2.79, -0.56
Comprehensibility	9.39 (3.05)	10.23 (3.20)	-3.01	503	.002*	0.27	-1.42, -0.24
Footing in World	9.96 (3.35)	10.79 (3.36)	-2.80	503	.002*	0.25	-1.44, -0.23
Depression	2.07 (1.90)	1.62 (1.79)	2.73	503	.01*	0.24	0.13, 0.77
Anxiety	2.28 (1.99)	1.60 (1.93)	3.88	503	.001*	0.35	0.33, 1.01

Note. * significant *p*-value

Table 8

Race Differences (White vs. POC) in Main Study Variables

Variable	White *M (SD)* *n* = 390	POC *M (SD)* *n* = 117	*t*	*df*	*p*	Cohen's *d*	BCa 95% CI
Individual SDoH Burden	0.08 (8.08)	0.96 (6.41)	-1.07	505	.23	0.12	-2.43, 0.55
Individual COVID-19 Burden	-0.03 (1.02)	0.10 (0.99)	-1.18	505	.23	0.13	-0.34 0.08
Community SDoH Burden	-0.16 (2.30)	0.55 (2.43)	-2.89	505	.01*	0.30	-1.23, -0.21
Community COVID-19 Burden	-0.08 (1.83)	0.30 (2.04)	-1.80	175.49	.08	0.20	-0.83, 0.09
Total Meaning-Making	20.35 (6.22)	19.38 (4.88)	1.75	239.74	.08	0.17	-0.08, 1.90
Comprehensibility	9.94 (3.28)	9.52 (2.62)	1.10	235.51	.30	0.14	-0.28, 0.87
Footing in World	10.50 (3.45)	9.86 (3.08)	1.92	211.25	.05	0.20	-0.04, 1.23
Depression	1.84 (1.93)	1.94 (1.63)	-0.58	222.98	.56	0.06	-0.46, 0.25
Anxiety	1.90 (2.02)	2.15 (1.88)	-1.20	505	.23	0.13	-0.64, 0.15

Note. * significant *p*-value

Table 9

Ethnicity Differences (Hispanic/Latino vs. Non-Hispanic/Latino) in Main Study Variables

Variable	Non-Hispanic/ Latino(a) *M (SD)* *n* = 424	Hispanic/ Latino(a) *M (SD)* *n* = 83	*t*	*df*	*p*	Cohen's *d*	BCa 95% CI
Individual SDoH Burden	-0.51 (7.14)	4.35 (9.22)	-4.54	102.14	.001*	0.59	-6.91, -2.63
Individual COVID-19 Burden	-0.07 (0.95)	0.39 (1.23)	-3.23	101.95	.007*	0.42	-0.72, -0.20
Community SDoH Burden	-0.11 (2.29)	0.57 (2.58)	-2.42	505	.02*	0.28	-1.24, -0.14
Community COVID-19 Burden	-0.09 (1.81)	0.49 (2.18)	-2.28	105.18	.03*	0.29	-1.10, -0.10
Total Meaning-Making	20.48 (5.74)	18.33 (6.66)	3.04	505	.004*	0.35	0.74, 3.57
Comprehensibility	9.88 (3.07)	9.22 (3.44)	1.76	505	.10	0.20	-0.05, 1.37
Footing in World	10.60 (3.27)	9.11 (3.66)	3.72	505	.001*	0.43	0.63, 2.29
Depression	1.74 (1.85)	2.49 (1.82)	-3.43	505	.001*	0.41	-1.19, -0.38
Anxiety	1.78 (1.91)	2.90 (2.11)	-4.83	505	.001*	0.56	-1.58, -0.68

Note. * significant *p*-value

Table 10

Relationship Differences in Main Study Variables

Variable	Single *M (SD)* *n* = 224	Partnered *M (SD)* *n* = 283	*t*	*df*	*p*	Cohen's *d*	BCa 95% CI
Individual SDoH Burden	-0.37 (6.35)	0.81 (8.64)	-1.77	502.38	.07	0.16	-2.48, 0.11
Individual COVID-19 Burden	-0.12 (0.87)	0.10 (1.11)	-2.61	504.98	.01*	0.22	-0.40, -0.04
Community SDoH Burden	0.01 (2.35)	-0.01 (2.35)	0.09	505	.92	0.01	-0.43, 0.44
Community COVID-19 Burden	-0.32 (1.43)	0.26 (2.15)	-3.62	490.74	.001*	0.32	-0.90, -0.27
Total Meaning-Making	20.38 (5.22)	19.92 (6.46)	0.88	504.75	.38	0.08	-0.64, 1.46
Comprehensibility	9.98 (2.87)	9.60 (3.34)	1.35	501.42	.18	0.12	-0.18, 0.92
Footing in World	10.40 (3.04)	10.32 (3.63)	0.28	503.27	.79	0.02	-0.52, 0.69
Depression	1.83 (1.76)	1.89 (1.95)	-0.37	496.03	.71	0.02	-0.37, 0.25
Anxiety	1.88 (1.90)	2.03 (2.06)	-0.86	505	.37	0.08	-0.48, 0.17

Note. * significant *p*-value

Table 11

Sexual Orientation Differences in Main Study Variables

Variable	Straight/ Hetero-sexual *M (SD)* *n* = 441	Queer/ LGBQA *M (SD)* *n* = 63	*t*	*df*	*p*	Cohen's *d*	BCa 95% CI
Individual SDoH Burden	-0.33 (7.34)	4.50 (8.81)	-4.75	502	.001*	0.60	-7.19, -2.49
Individual COVID-19 Burden	-0.04 (0.97)	0.26 (1.24)	-1.84	73.33	.07	0.27	-0.64, 0.01
Community SDoH Burden	0.01 (2.37)	-0.11 (2.25)	0.37	502	.66	0.05	-0.49, 0.76
Community COVID-19 Burden	-0.01 (1.86)	0.03 (1.98)	-0.16	502	.88	0.02	-0.57, 0.48
Total Meaning-Making	20.37 (5.94)	18.32 (5.57)	2.59	502	.007*	0.36	0.55, 3.54
Comprehensibility	9.80 (3.16)	9.52 (1.96)	0.65	502	.52	0.11	-0.50, 1.09
Footing in World	10.57 (3.33)	8.79 (3.24)	3.97	502	.001*	0.54	0.97, 2.62
Depression	1.72 (1.80)	2.84 (2.00)	-4.57	502	.001*	0.59	-1.67, -0.58
Anxiety	1.82 (1.95)	2.94 (2.01)	-4.22	502	.001*	0.57	-1.62, -0.58

Note. * significant *p*-value

Table 12

Geographic Differences in Main Study Variables

Variable	Midwest *M (SD)* *n* = 117	Northeast *M (SD)* *n* = 86	Southeast *M (SD)* *n* = 162	Southwest *M (SD)* *n* = 61	West *M (SD)* *n* = 81	*p*	Partial Eta Squared
Individual SDoH Burden	-0.68 (6.46)	2.05 (10.00)	-0.58 (6.89)	1.89 (7.54)	0.33 (8.02)	0.03	0.03
Individual COVID-19 Burden	2.21 (1.74)	2.92 (2.42)[c]	2.17 (1.75)[b]	2.48 (2.05)	2.54 (1.93)	0.04	0.02
Community SDoH Burden	-1.19 (1.90)[cde]	-0.51 (2.84)[cde]	0.42 (1.95)[ab]	0.86 (2.09)[ab]	0.76 (2.50)[ab]	<.001	0.11
Community COVID-19 Burden	-0.51 (0.94)[bd]	1.59 (2.94)[acde]	-0.71 (0.66)[bd]	-0.30 (0.77)[bd]	0.73 (2.45)[abcd]	<.001	0.21
Total Meaning-Making	20.79 (5.57)[b]	18.33 (6.60)[ac]	20.57 (5.63)[b]	19.57 (5.66)	20.59 (6.28)	.02	0.02
Comprehensibility	10.04 (3.09)	9.14 (3.38)	9.80 (2.97)	9.64 (2.90)	10.09 (3.41)	.26	0.01
Footing in World	10.74 (3.32)[b]	9.19 (3.65)[ac]	10.78 (3.22)[b]	9.93 (3.16)	10.51 (3.38)	.004	0.03
Depression	1.84 (1.78)	2.26 (2.07)	1.66 (1.88)	2.15 (1.95)	1.65 (1.59)	.08	0.02
Anxiety	1.83 (2.02)	2.45 (2.19)	1.88 (2.00)	2.16 (1.99)	1.63 (1.58)	.06	0.02

Note.
[a] significantly different from Midwestern participants
[b] significantly different from Northeastern participants
[c] significantly different from Southeastern participant

[d] significantly different from Southwestern participants
[e] significantly different from Western participants

Table 13

Educational Differences in Main Study Variables

Variable	No High School Diploma/GED *M (SD)* *n* = 12	High School Diploma/GED *M (SD)* *n* =136	Some College/ Vocational School *M (SD)* *n* = 132	College/ Vocational Degree *M (SD)* *n* = 177	Graduate/ Professional Degree *M (SD)* *n* = 50	*p*	Partial Eta Squared
Individual SDoH Burden	2.02 (6.08)	-0.01 (5.83)[e]	0.35 (7.13)[e]	-0.98 (7.95)[e]	5.02 (11.29)[bcd]	<.001	0.05
Individual COVID-19 Burden	3.33 (2.31)	1.96 (1.64)[e]	2.45 (1.57)[e]	2.33 (2.02)[e]	3.48 (2.75)[bcd]	<.001	0.05
Community SDoH Burden	0.62 (3.11)	0.02 (2.26)	-0.37 (2.26)	0.20 (2.38)	0.03 (2.46)	.25	0.01
Community COVID-19 Burden	-0.09 (1.83)[e]	-0.48 (1.36)[e]	-0.43 (1.12)[e]	0.07 (1.86)[e]	2.27 (2.95)[abcd]	<.001	0.18
Total Meaning-Making	19.67 (6.05)	20.26 (4.55)	19.70 (5.28)	20.89 (6.77)	18.26 (7.36)	.07	0.02
Comprehensibility	9.42 (2.91)	9.85 (2.42)	9.58 (2.90)	10.10 (3.61)	8.98 (3.68)	.22	0.01
Footing in World	10.25 (3.65)	10.42 (2.83)	10.12 (3.13)	10.79 (3.70)	9.28 (3.91)	.07	0.02
Depression	3.00 (2.05)	1.83 (1.79)	2.00 (1.82)	1.47 (1.78)[e]	2.68 (2.07)[d]	<.001	0.05
Anxiety	3.50 (1.88)[d]	1.94 (1.89)	2.21 (2.00)[d]	1.46 (1.87)[ace]	2.76 (2.14)[d]	<.001	0.06

Note.
[a] significantly different from participants with no high school diploma/GED

[b] significantly different from participants with a high school diploma/GED
[c] significantly different from participants with some college or vocational school
[d] significantly different from participants with a college or vocational degree
[e] significantly different from participants with a graduate or professional degree

Table 14

Correlations among Main Study Variables

Variable	1.	2.	3.	4.	5.	6.	7.	8.
1. Individual SDoH Burden	-							
2. Individual COVID-19 Burden	.52** [.42, .61]	-						
3. Community SDoH Burden	.07 [-.03, .17]	.05 [-.04, .15]	-					
4. Community COVID-19 Burden	.21** [.10, .31]	.16** [.05, .27]	.36** [.28, .44]	-				
5. Total Meaning-Making	-.53** [-.56, -.45]	-.40** [-.48, -.29]	-.10* [-.19, -.01]	-.19** [-.27, -.10]	-			
6. Comprehensibility	-.39** [-.47, -.29]	-.31** [-.41, -.20]	-.08 [-.17, .00]	-.16** [-.25, -.07]	.90** [.89, .92]	-		
7. Footing in World	-.57** [-.63, -.50]	-.40** [-.48, -.31]	-.09* [-.18, -.01]	-.18** [-.26, -.09]	.92** [.90, .93]	.66** [.60, .72]	-	
8. Depression	.56** [.50, .62]	.33** [.24, .41]	.02 [-.08, .11]	.10* [.01, .19]	-.48** [-.56, -.41]	-.32** [-.41, -.23]	-.54** [-.61, -.47]	-

9. Anxiety	.56** [.49, .62]	.33** [.24, .41]	.03 [-.07, .13]	.11* [.02, .20]	-.49** [-.56, -.41]	-.35** [-.43, -.26]	-.53** [-.61, -.45]	.83** [.78, .86]

Note. Values in square brackets indicate the BCa 95% confidence interval for each correlation.

** $p < .001$
* $p < .05$

Table 15

Model Summary of Hierarchical Regression Predicting Total Meaning Made of the Pandemic

Model	*R*	R^2	Adjusted R^2	$R^2\Delta$	FΔ	*df1*	*df2*	*p*
1.	.32	.11	.08	.11	3.97	14	476	<.001
2.	.56	.32	.29	.21	72.98	2	474	<.001
3.	.57	.32	.29	.01	2.62	2	472	.07

Note. Model 1 includes only demographic variables. Model 2 includes demographic variables and individual burden variables. Model 3 contains demographic variables, individual burden variables, and community burden variables.

Table 16

Coefficients for Hierarchical Regression Predicting Total Meaning Made of the Pandemic

		Model 1			Model 2			Model 3	
Predictor Variable	*B (SE B)*	BCa 95% CI	β	*B (SE B)*	BCa 95% CI	β	*B (SE B)*	BCa 95% CI	β
Age	.07 (.02)	0.04, 0.10	.23**	.02 (.02)	-0.01, 0.05	.05	.01 (.02)	-0.02, 0.05	.05
Gender	.94 (.56)	-0.17, 2.17	.08	1.21 (.50)	0.24, 2.2	.10*	1.24 (.50)	0.26, 2.23	.11*
Race	-.28 (.56)	-1.37, 0.76	-.02	-.46 (.53)	-1.55, 0.53	-.03	-.30 (.53)	-1.42, 0.77	-.02
Ethnicity	-1.00 (.80)	-2.63, 0.64	-.06	.10 (.67)	-1.21, 1.35	.01	.17 (.67)	-1.04, 1.40	.01
Sexual Orientation	-.37 (.80)	-2.02, 1.21	-.02	.52 (.62)	-0.67, 1.80	.03	.42 (.64)	-0.79, 1.67	.02
Relationship Status	-.25 (.49)	-1.25, 0.77	-.02	.10 (.46)	-0.84, 1.09	.01	.15 (.47)	-0.82, 1.19	.01
Geographic Region									
Midwest	.60 (.66)	-0.57, 1.75	.04	.25 (.60)	-0.83, 1.23	.02	.11 (.63)	-1.01, 1.17	.01
Northeast	-1.28 (.82)	-2.89, 0.36	-.08	-8.1 (.68)	-2.12, 0.52	-.05	-.49 (.79)	-1.88, 0.93	-.03
Southwest	.06 (.81)	-1.48, 1.59	.00	.36 (.74)	-0.92, 1.70	.02	.47 (.74)	-0.81, 1.83	.03
West	.45 (.81)	-1.03, 1.95	.03	.48 (.71)	-0.79, 1.78	.03	.78 (.71)	-0.52, 2.16	.05
Education									
No high school diploma/GED	-.29 (1.72)	-3.76, 3.08	-.01	.39 (1.64)	-2.95, 3.48	.01	.45 (1.78)	-2.91, 3.71	.01

High school diploma/GED	.63 (.66)	-0.6-, 1.88	.05	.23 (.61)	-0.91, 1.39	.02	.09 (.62)	-1.04, 1.23	.01
Some college	-.50 (.68)	-1.80, 0.82	-.04	-.44 (.63)	-1.64, 0.70	-.03	-.61 (.63)	-1.79, 0.56	-.05
Graduate/ Professional degree	-.73 (1.19)	-3.14, 1.61	-.04	.40 (.89)	-1.27, 2.11	.02	.65 (.91)	-1.00, 2.48	.03
Individual SDoH Burden				-.32 (.04)	-0.40, -0.25	-.42**	-.22 (.04)	-0.39, -0.23	-.41**
Individual COVID-19 Burden				-.48 (.15)	-0.76, -0.19	-.16*	-.48 (.15)	-0.75, -0.19	-.16*
Community SDoH Burden							-.12 (.12)	-0.35, 0.08	-.05
Community COVID-19 Burden							-.23 (.17)	-0.56, 0.11	-.07

Note. ** $p < .001$
* $p < .05$

Table 17

Model Summary of Hierarchical Regression Predicting Depression

Model	*R*	R^2	Adjusted R^2	$R^2\Delta$	FΔ	*df1*	*df2*	*p*
1.	.43	.19	.16	.19	7.79	14	475	<.001
2.	.60	.36	.34	.17	63.11	2	473	<.001
3.	.60	.36	.33	.00	.11	2	471	.90
4.	.63	.40	.37	.04	29.63	1	470	<.001

Note. Model 1 includes only demographic variables. Model 2 contains demographic variables and individual burden variables. Model 3 includes demographic variables, individual burden variables, and community burden variables. Model 4 contains demographic variables, individual burden variables, community burden variables, and total meaning made of the pandemic.

Table 18

Coefficients for Hierarchical Regression Predicting Depression

Predictor Variable	Model 1			Model 2			Model 3			Model 4		
	B (SE B)	BCa 95% CI	β	*B (SE B)*	BCa 95% CI	β	*B (SE B)*	BCa 95% CI	β	*B (SE B)*	BCa 95% CI	β
Age	-.03 (.01)	-.04, -.03	-.34**	-.02 (.00)	-.03, -.01	-.16**	-.02 (.00)	-.03, -.01	-.16**	-.02 (.00)	-.02, -.01	-.15*
Gender	-.18 (.17)	-.49, .13	-.05	-.29 (.14)	-.56, -.02	-.08	-.28 (.14)	-.56, -.02	-.08	-.19 (.14)	-.46, .07	-.05
Race	-.26 (.18)	-.63, .12	-.06	-.19 (.17)	-.51, .17	-.04	-.18 (.17)	-.50, .18	-.04	-.20 (.17)	-.52, .14	-.05
Ethnicity	.23 (.22)	-.19, .62	.05	-.08, .(19)	-.43, .27	-.02	-.08 (.19)	-.42, .26	-.02	-.07 (.19)	-.41, .07	-.01
Sexual Orientation	.55 (.28)	.05, 1.07	.10*	.29 (.26)	-.18, .78	.05	.28 (.26)	-.19, .78	.05	.32 (.25)	-.15, .82	.06
Relationship Status	.03 (.16)	-.28, .28	.01	-.05 (.15)	-.33, .21	-.02	-.05 (.15)	-.34, .22	-.01	-.04 (.15)	-.31, .22	-.01
Geographic Region												
Midwest	.05 (.21)	-.34, .47	.01	.16 (.19)	-.19, .56	.04	.17 (.20)	-.21, .56	.04	.17 (.19)	-.18, .57	.04
Northeast	.26 (.26)	-.29, .78	.05	.14 (.22)	-.31, .58	.03	.19 (.23)	-.28, .65	.04	.15 (.22)	-.31, .58	.03
Southwest	.18 (.28)	-.36, .73	.03	.09 (.25)	-.39, .58	.02	.10 (.26)	-.38, .58	.02	.13 (.26)	-.35, .63	.02
West	-.12 (.21)	-.54, .31	-.03	-.12 (.19)	-.47, .25	-.02	-.10 (.20)	-.45, .27	-.02	-.04 (.20)	-.40, .33	-.01
Education												
No high school diploma/GED	1.09 (.60)	-.12, 2.22	.09	.91 (.61)	-.29, 2.03	.07	.91 (.62)	-.29, 2.08	.07	.95 (.58)	-.23, 2.03	.08

High school diploma/GED	-.10 (.21)	-.51, .32	-.02	-.02 (.19)	-.40, .36	.00	-.03 (.19)	-.43, .36	-.01	-.02 (.18)	-.41, .34	.00
Some college	.21 (.20)	-.19, .63	.05	.18 (.18)	-.18, .57	.04	.18 (.18)	-.19, .57	.04	.13 (.18)	-.25, .52	.03
Graduate/ Professional degree	.49 (.32)	-.16, 1.14	.08	.17 (.26)	-.32, .70	.03	.20 (.28)	-.32, .78	.03	.25 (.27)	-.28, .82	.04
Individual SDoH Burden				.10 (.01)	.08, .13	.43**	.10 (.01)	.08, .13	.43**	.08 (.01)	.05, .11	.33**
Individual COVID-19 Burden				.07 (.04)	-.02, .16	.08	.07 (.04)	-.02, .16	.08	.04 (.04)	-.05, .12	.04
Community SDoH Burden							.00 (.03)	-.06, .06	.00	-.01 (.03)	-.07, .05	-.01
Community COVID-19 Burden							-.02 (.05)	-.11, .07	-.02	-.04 (.05)	-.12, .05	-.04
Total Meaning-Making										-.07 (.02)	-.12, .04	-.24**

Note. ** $p < .001$
* $p < .05$

Table 19

Model Summary of Hierarchical Regression Predicting Anxiety

Model	*R*	R^2	Adjusted R^2	$R^2\Delta$	FΔ	*df1*	*df2*	*p*
1.	.49	.24	.21	.24	10.47	14	475	<.001
2.	.62	.39	.37	.15	59.75	2	473	<.001
3.	.62	.39	.37	.00	0.03	2	471	.98
4.	.65	.43	.40	.04	30.35	1	470	<.001

Note. Model 1 includes only demographic variables. Model 2 contains demographic variables and individual burden variables. Model 3 includes demographic variables, individual burden variables, and community burden variables. Model 4 contains demographic variables, individual burden variables, community burden variables, and total meaning made of the pandemic.

Table 20

Coefficients for Hierarchical Regression Predicting Anxiety

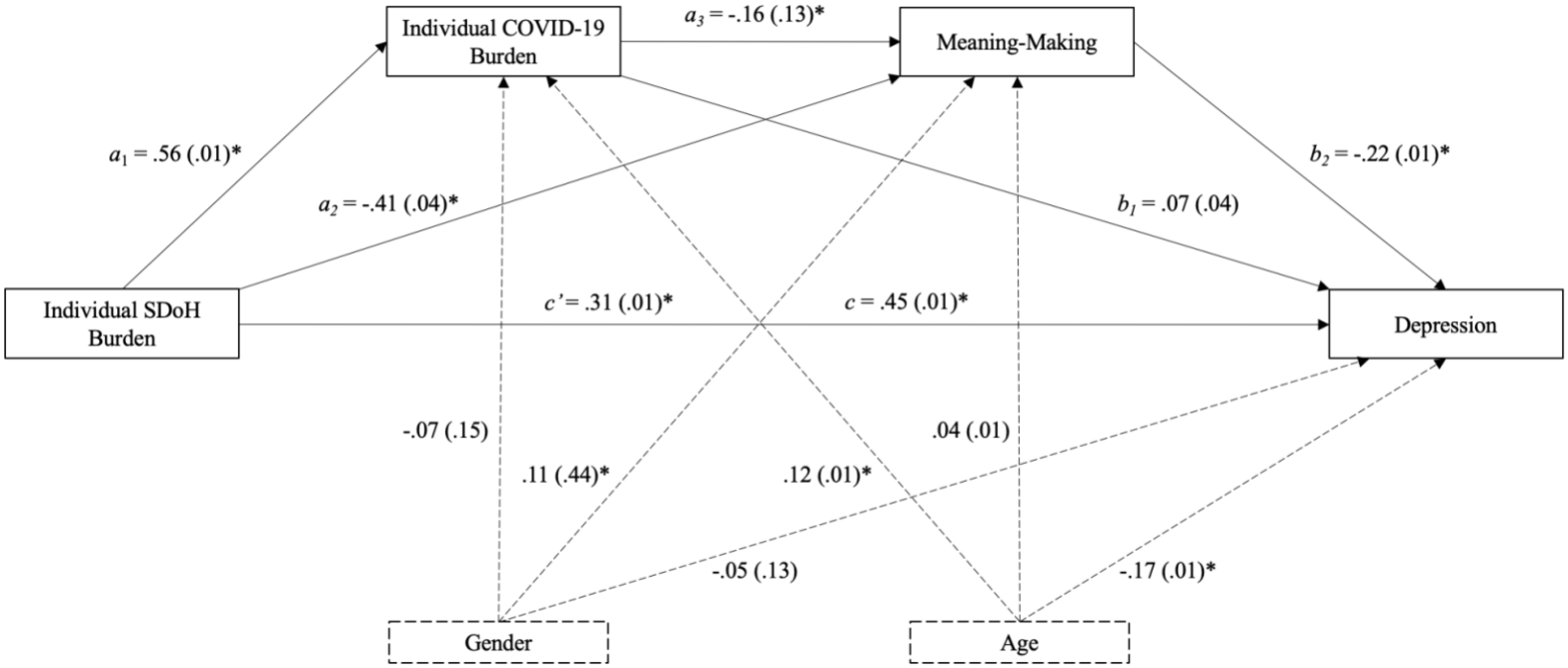
	Model 1			Model 2			Model 3			Model 4		
Predictor Variable	*B (SE B)*	BCa 95% CI	β	*B (SE B)*	BCa 95% CI	β	*B (SE B)*	BCa 95% CI	β	*B (SE B)*	BCa 95% CI	β
Age	-.04 (.01)	-.05, -.03	-.35**	-.02 (.01)	-.03, -.01	-.18**	-.02 (.01)	-.03, -.01	-.18**	-.02 (.01)	-.03, -.01	-.17**
Gender	-.34 (.18)	-.68, .06	-.08	-.45 (.16)	-.77, -.11	-.11*	-.45 (.16)	-.76, -.12	-.11*	-.35 (.15)	-.63, -.02	-.09*
Race	-.24 (.20)	-.63, .17	-.05	-.16 (.19)	-.55, .23	-.04	-.16 (.19)	-.53, .23	-.03	-.18 (.19)	-.54, .22	-.04
Ethnicity	.60 (.27)	.06, 1.16	.11*	.30 (.24)	-.13, .77	.06	.31 (.24)	-.15, .77	.06	.31 (.23)	-.15, .77	.06
Sexual Orientation	.45 (.30)	-.09, 1.06	.07	.20 (.26)	-.30, .73	.03	.19 (.26)	-.31, .70	.03	.22 (.26)	-.30, .73	.04
Relationship Status	.15 (.17)	-.19, .46	.04	.07 (.15)	-.23, .39	.02	.08 (.15)	-.24, .40	.02	.09 (.15)	-.22, .39	.02
Geographic Region												
Midwest	-.22 (.22)	-.67, .25	-.05	-.12 (.20)	-.53, .32	-.03	-.11 (.21)	-.53, .36	-.02	-.10 (.20)	-.48, .20	-.02
Northeast	.27 (.27)	-.23, .81	.05	.15 (.23)	-.24, .60	.03	.18 (.25)	-.28, .71	.03	.14 (.01)	-.31, .64	.03
Southwest	-.07 (.29)	-.64, .52	-.01	-.29 (.20)	-.67, .37	-.02	-.14 (.27)	-.67, .38	-.02	-.11 (.27)	-.65, .42	-.02
West	-.39 (.21)	-.84, .05	-.07	-.39 (.20)	-.78, .03	-.07	-.37 (.22)	-.82, .11	-.07	-.31 (.21)	-.73, .14	-.06
Education												
No high school diploma/GED	1.50 (.48)	.59, 2.49	.11*	1.34 (.52)	.33, 2.36	.10	1.34 (.52)	.33, 2.31	.10	1.38 (.53)	.42, 2.36	.10

High school diploma/GED	-.06 (.22)	-.44, .31	-.01	.03 (.20)	-.32, .37	.01	.03 (.20)	-.34, .37	.01	.03 (-.02)	-.32, .34	.01
Some college	.39 (.21)	.00, .80	.09	.37 (.18)	.02, .72	.08	.37 (.19)	.02, .72	.08	.32 (.18)	-.02, .68	.07
Graduate/ Professional degree	.55 (.36)	-.16, 1.22	.08	.22 (.29)	-.37, .80	.03	.24 (.30)	-.41, .87	.04	.29 (.30)	-.35, .92	.04
Individual SDoH Burden				.11 (.01)	.08, .13	.42**	.11 (.01)	.08, .14	.42**	.08 (.01)	.05, .11	.32**
Individual COVID-19 Burden				.06 (.05)	-.03, .14	.06	.06 (.05)	-.02, .14	.06	.02 (.05)	-.06, .11	.02
Community SDoH Burden							.00 (.04)	-.09, .10	.01	-.01 (.04)	-.09, .08	-.01
Community COVID-19 Burden							-.01 (.05)	-.11, .07	-.01	-.03 (.05)	-.12, .05	-.03
Total Meaning-Making										-.08 (.02)	-.11, -.05	-.23**

Note. ** $p < .001$
* $p < .05$

Figure 1

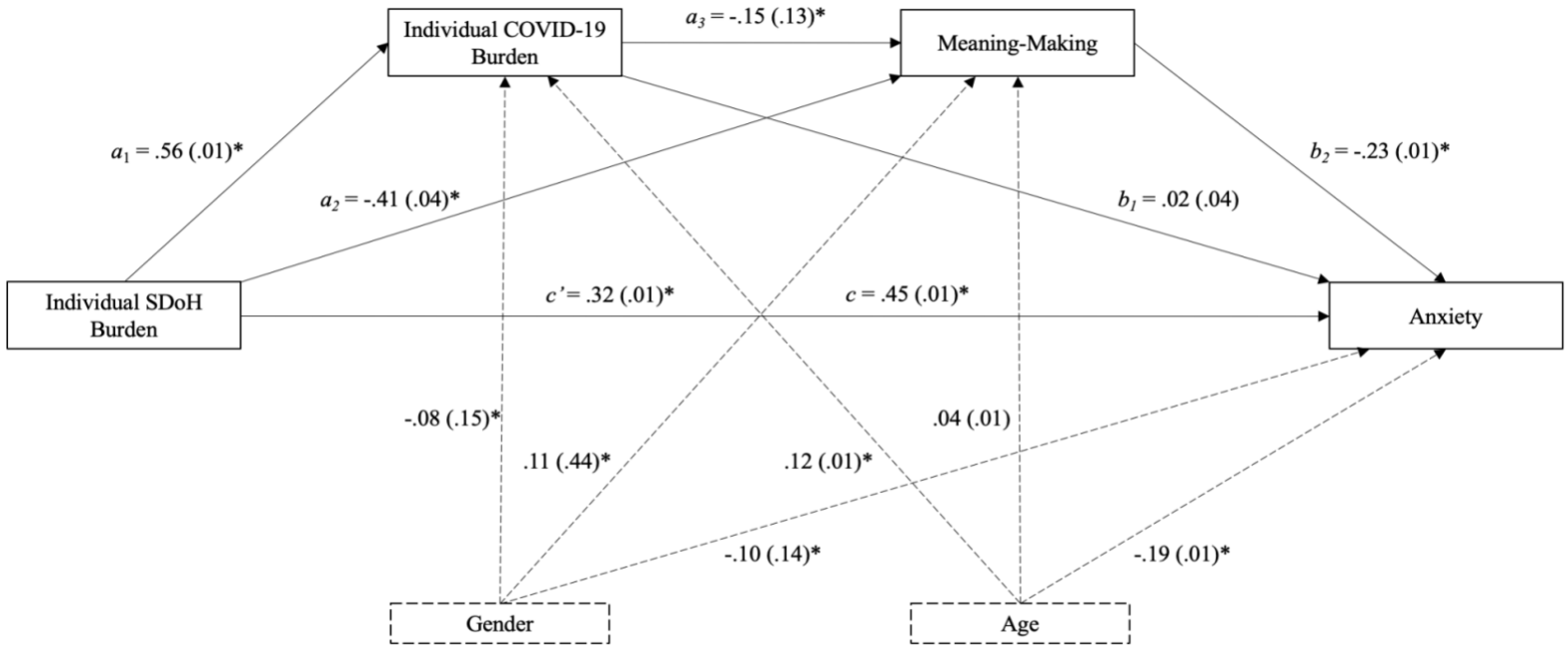
Serial Mediation Model Predicting Depression



Note. Serial mediation controlling for gender and age, showing the influence of individual SDoH burden on depressive symptoms, as sequentially mediated by individual COVID-19 burden and meaning-making. All coefficients are standardized. Numbers in parentheses indicate standard errors. Asterisks indicate significant coefficients ($p < .05$). The c path in the model reflects the total effect; the c' path reflects the direct effect.

Figure 2

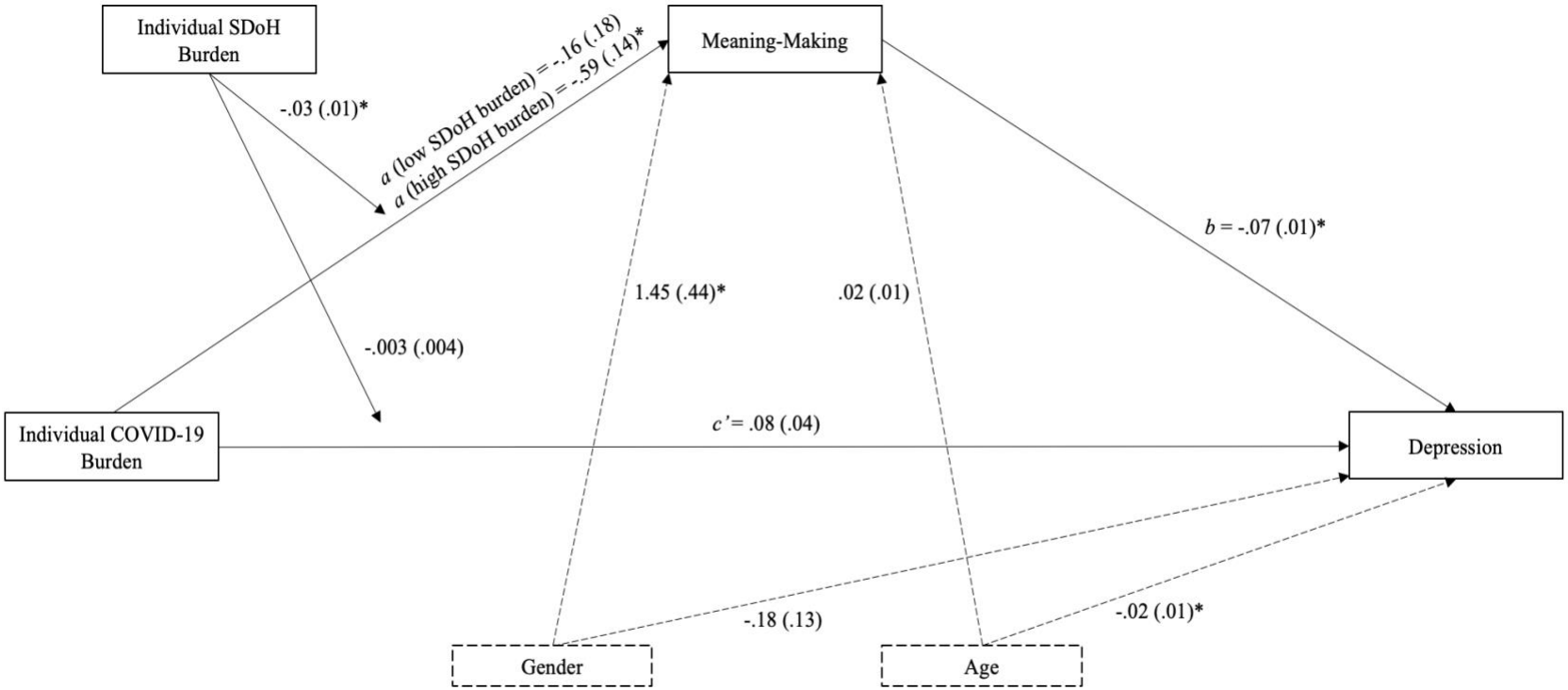
Serial Mediation Model Predicting Anxiety



Note. Serial mediation controlling for gender and age, showing the influence of individual SDoH burden on anxiety, as sequentially mediated by individual COVID-19 burden and meaning-making. All coefficients are standardized. Numbers in parentheses indicate standard errors. Asterisks indicate significant coefficients ($p < .05$). The c path in the model reflects the total effect; the c' path reflects the direct effect.

Figure 3

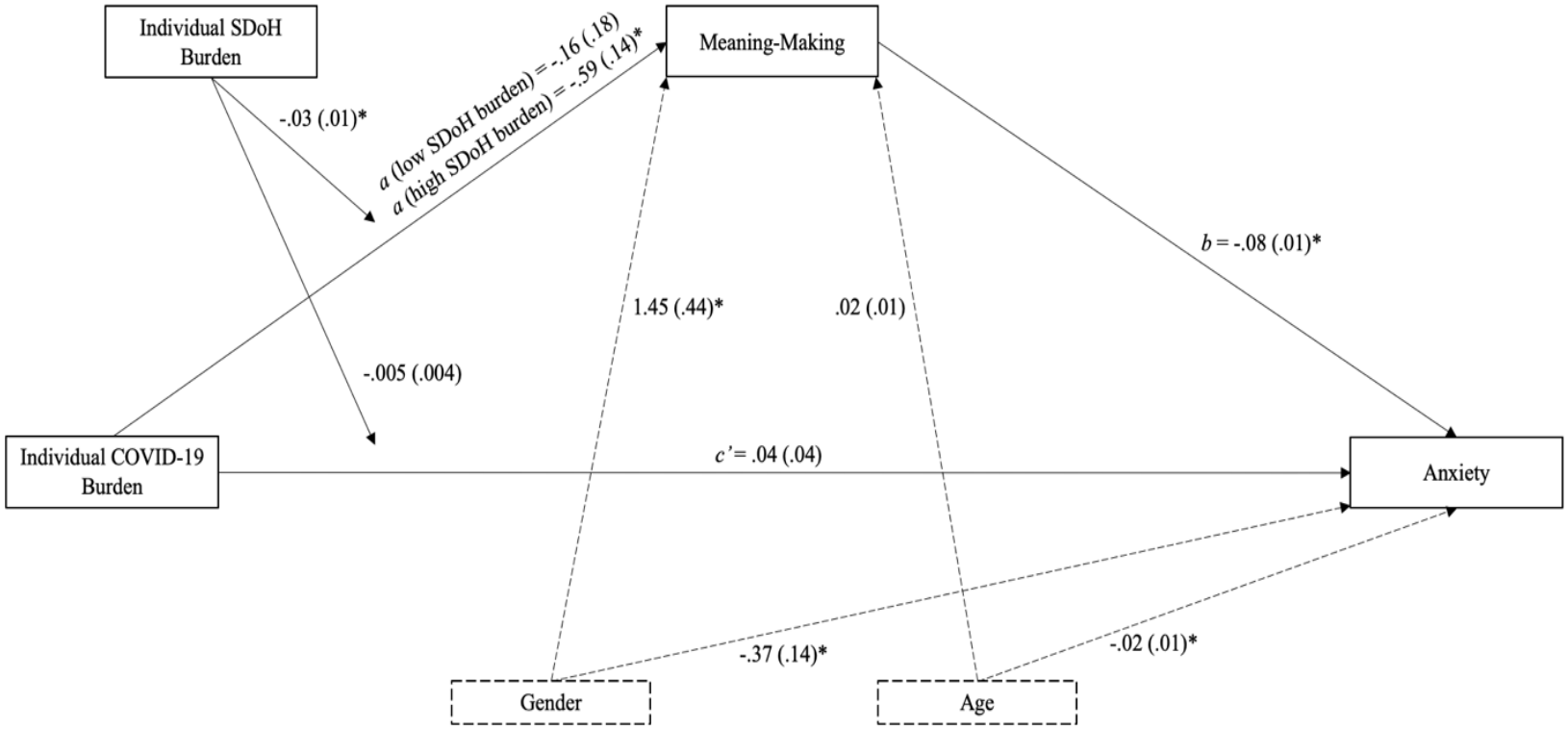
Moderated Mediation Model Predicting Depression



Note. Moderated mediation controlling for gender and age, showing the influence of individual COVID-19 burden on depression, as mediated by meaning-making and moderated by individual SDoH burden. All coefficients are standardized. Numbers in parentheses indicate standard errors. Asterisks indicate significant coefficients ($p < .05$). The c' path reflects the direct effect.

Figure 4

Moderated Mediation Model Predicting Anxiety



Note. Moderated mediation controlling for gender and age, showing the influence of individual COVID-19 burden on anxiety, as mediated by meaning-making and moderated by individual SDoH burden. All coefficients are standardized. Numbers in parentheses indicate standard errors. Asterisks indicate significant coefficients ($p < .05$). The c' path reflects the direct effect.

APPENDIX

Welcome to the survey. Please be sure to read the prompts and instructions provided when answering questions.

[Demographics Block]

The first part of the survey will ask you to answer questions about yourself.

1. What is your gender? *Please select all that apply.*
   - Woman
   - Man
   - Other (Please Specify): _____
2. What is your race? *Please select all that apply.*
   - American Indian or Alaska Native
   - Asian
   - Black or African American
   - Native Hawaiian or Pacific Islander
   - White
   - Some Other race (Please Specify):_____
3. Are you of Hispanic or Latino origin?
   - No
   - Yes
4. What is your age range (in years)?
   - 18 - 29
   - 30 - 44
   - 45 - 59
   - 60 +
5. Which region of the country do you live in?
   - Northeast - CT, ME, MA, NH, RI, VT, NJ, NY, PA
   - Midwest - IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI
   - South - DE, DC, FL, GA, MD, NC, SC, VA, WV, AL, KY, MS, TN, AR, LA, OK, TX
   - West - AZ, CO, ID, NM, MO, UT, NV, WY, AL, CA, HI, OR, WA
6. What is the zip code of your current home address?

   _____
7. What is your sexual orientation? *Please select all that apply.*
   - Heterosexual or Straight

- Gay
- Lesbian
- Bisexual
- Pansexual
- Queer
- Asexual
- Other (Please Specify):_____

8. What is your relationship status?
    - Single
    - Married, in domestic partnership, or in a civil union
    - In a committed relationship (no legal status)
    - Divorced or Separated
    - Widowed

9. Do you have children under the age of 18 who live with you?
    - No
    - Yes

10. What was your total household income (before taxes) during the past 12 months?
    - Less than $25,000
    - $25,000 to $34,999
    - $35,000 to $49,999
    - $50,000 to $74,999
    - $75,000 to $99,999
    - $100,000 to $149,999
    - $150,000 or more

11. How many family members or dependents (not including yourself) do you currently live with?
    - 0
    - 1
    - 2
    - 3
    - 4
    - 5+

12. What is the highest degree or level of education you have completed?
    - Some high school or less
    - High School Graduate or GED
    - Some College or Vocational School
    - College or Vocational School Degree
    - Professional or Graduate Degree (MA, PhD, JD, MD, EdD, PharmD)

13. Is English one of your primary languages?
    - No

- Yes

14. Which of the following best describes your current occupational status? *Please select all that apply.*
    - Employed full-time (including self-employment)
    - Employed part-time (including self-employment)
    - Keeping house (not paid)
    - Student
    - Retired
    - Unemployed
    - Other (Please Describe):_____

15. Have you had a change in employment since the beginning of the COVID-19 pandemic?
    - Yes, I became unemployed.
    - Yes, I became a part-time employee or have had my hours cut.
    - Yes, I have had to work more hours.
    - No, the status of my employment has not changed.

16. Are you working in-person or remotely? *If you are working both in-person and remotely on a flexible schedule, please check both options. If you are currently not working, please check "N/A".*
- In-person
- Remotely
- N/A

17. Since the pandemic began, have you received unemployment benefits?
- Yes
- No, I applied for benefits but didn't receive them.
- No, I never applied for benefits.

18. *Essential workers frequently include those who work in healthcare, teaching, the service industry, construction and infrastructure, law enforcement, and in some manufacturing and retail positions. This list may be different depending on the area you live or work in.*

    In your state/city/county, are you considered an "essential worker"?
    - No
    - Yes (Please Specify): _____

19. What is your current health insurance status? If you have mixed coverage (private and public insurance), which one do you rely on the most?
    - Private Health Insurance
    - Public Health Insurance
    - Uninsured

20. Were you without insurance for any amount of time in the past 12 months?
    - No
    - Yes

[Social Determinants & Resources Block]

The COVID-19 pandemic is affecting people in many different ways. The next set of questions asks about **your own needs and challenges** during this time.

21. In the past 12 months, how often were you treated badly because of your race or ethnicity?
    - Never
    - Once or twice
    - Sometimes
    - Often
    - Very Often

22. In the past 2 weeks, how often were you treated badly because of your race or ethnicity?
    - Never
    - Once or twice
    - Three to five times
    - Daily or almost daily

23. In the past 12 months, which of the following best describes your living situation?
    - I have had a steady place to live.
    - I had a steady place to live, but was worried about losing it.
    - I did not have a steady place to live (I was temporarily staying with others, in a hotel, in a shelter, living outside on the street, on a beach, in a car, abandoned building, bus or train station, or in a park).

24. What is your living situation today?
    - I have a steady place to live.
    - I have a place to live today, but I am worried about losing it in the future.
    - I do not have a steady place to live (I am temporarily staying with others, in a hotel, in a shelter, living outside on the street, on a beach, in a car, abandoned building, bus or train station, or in a park).

25. In the past 12 months, were you worried that your food would run out before you were able to get more (due to physical, financial, or other reasons)?
    - Never true
    - Sometimes true
    - Often true

26. Are you currently worried that your food will run out before you are able to get more?
    - No
    - Yes

27. Over the past 12 months, if for any reason you needed help with day-to-day activities such as bathing, preparing meals, shopping, managing finances, childcare, etc., were you getting the help you needed?
    - I didn't need any help
    - I got all the help I needed
    - I could've used a little more help
    - I needed a lot more help

28. Currently, are you worried about help with day-to-day activities?
    - No
    - Yes

29. In the past 12 months, has the electric, gas, oil, or water company threatened to shut off services in your home?
    - No
    - Yes

30. Are you currently worried about being able to pay for your utilities?
    - No
    - Yes

31. In the past 12 months, how often have you felt unsafe or threatened by others in your home? That is, how often were you concerned that someone will physically hurt you, threaten to harm you, insult or talk down to you, or scream or curse at you?
    - Never
    - Rarely
    - Sometimes
    - Fairly often
    - Frequently

32. Are you currently worried about feeling unsafe or threatened by others in your own home?
    - No
    - Yes

If Q31 is “rarely, sometimes, fairly often, or frequently” OR Q32 is “Yes”, then the following message will be presented:
“If you are currently feeling unsafe or threatened by others in your home, please call the National Domestic Violence Hotline at 1-800-799-7233 or text “LOVEIS” to 22522.

The Hotline provides lifesaving tools and immediate support to empower victims and survivors to find safety and live free of abuse. We also provide support to friends and family members who are concerned about a loved one.

If it's not safe for you to call, or if you don't feel comfortable doing so, another option for getting direct help is to use their live chat service here on this website [https://www.thehotline.org/what-is-live-chat/]. You'll receive the same one-on-one, real-time, confidential support from a trained advocate as you would on the phone.

If you are in an emergency situation, please call 911."

33. In the past 12 months, how difficult has it been for you to pay for medical care or mental health services?
    - Not Difficult at all
    - Somewhat Difficult
    - Very Difficult

34. Are you currently worried about being able to afford medical care or mental health services?
    - No
    - Yes

35. In the past 12 months, how difficult has it been for you to find or maintain employment?
    - Not Difficult at all
    - Somewhat Difficult
    - Very Difficult

36. How many times in the past 12 months have you had 5 or more drinks in a day (males) or 4 or more drinks in a day (females)? *One drink is 12 ounces of beer, 5 ounces of wine, or 1.5 ounces of 80-proof spirits.*
    - Never
    - Once or Twice
    - Monthly
    - Weekly
    - Daily or Almost Daily

37. How many times in the past 2 weeks have you had 5 or more drinks in a day (males) or 4 or more drinks in a day (females)?
    - Never
    - Once or Twice
    - Three to Five times
    - Daily or Almost Daily

38. How many times in the past 12 months have you smoked cigarettes, cigars, or marijuana (not including electronic cigarettes)?

- Never
- Once or Twice
- Monthly
- Weekly
- Daily or Almost Daily

39. How many times in the past 2 weeks have you smoked cigarettes, cigars, or marijuana (not including electronic cigarettes)?
    - Never
    - Once or Twice
    - Three to Five times
    - Daily or Almost Daily

40. How many times in the past 12 months have you used illegal drugs or used prescription drugs for non-medical reasons?
    - Never
    - Once or Twice
    - Monthly
    - Weekly
    - Daily or Almost Daily

41. How many times in the past 2 weeks have you used illegal drugs or used prescription drugs for non-medical reasons?
    - Never
    - Once or Twice
    - Three to Five times
    - Daily or Almost Daily

[Medical Characteristics Block]

42. What is your exact age (in years)?

    _____

43. Do you currently have any of the following medical issues? *Please select all that apply. If this question does not apply to you, please skip this question.*
    - Hypertension or High Blood Pressure
    - Heart Disease (including heart failure, coronary artery disease, cardiomyopathy)
    - Diabetes
    - Sickle Cell Disease or other hemoglobin disorder
    - Cerebrovascular Disease (including cerebral aneurysm and cerebrovascular stenosis)
    - Moderate to Severe Asthma

- Chronic Lung Disease (Including COPD, Cystic Fibrosis, Pulmonary Fibrosis, Emphysema, or Lung Cancer)
- Chronic Kidney or Liver Disease
- HIV/AIDS
- Cancer
- Neurological Disorders (Epilepsy, Multiple Sclerosis, ALS or Leu Gehrig's disease, Huntington's, Alzheimer's, or Parkinson's diseases)
- Any other immunocompromised state (including as a result of HIV, Lupus, rheumatoid arthritis, organ or bone marrow transplant, etc.)
- Other (Please Specify):_____

If any medical conditions in Q40 are checked:

43a. You indicated that you currently have or have been diagnosed with [piped text of conditions indicated]. Do you feel like you currently have everything you need to manage these conditions?

- No
- Yes
- Unsure

44. What is your weight, in pounds?

_____

45. What is your height, in feet and inches?

Feet: [*drilldown options from 3-8*]
Inches: [*drilldown options from 1-11*]

46. Are you currently pregnant?

- No
- Yes

[Attention Check]

47. For this question, please select “Blue” from the options below.

- Red
- Green
- Orange
- Blue
- Yellow

[Mental Health Block]

48. Over the last 2 weeks, how often have you been bothered by the following problems?

	Not at all (1)	Several days (2)	More than half the days (4)	Nearly every day (5)
Little interest or pleasure in doing things				
Feeling down, depressed or hopeless				
Feeling nervous, anxious or on edge				
Not being able to stop or control worrying				

49. During the past six months, have you sought mental health treatment?

- No
- Yes

50. In your lifetime, have you been diagnosed or struggled with any of the following conditions?
    - Anxiety
    - Depression
    - Bipolar Disorder
    - Schizophrenia
    - Eating Disorder
    - Obsessive Compulsive Disorder
    - Post-Traumatic Stress Disorder
    - Substance Use Disorder
    - Other (Please Specify): _____

51. Do you feel like you currently have everything you need to manage your mental health?

- No
- Yes
- Unsure

If any items in Q50 are checked or Q51 is “No” or “Unsure”, then the following message will be presented:
“If you are currently experiencing high levels of distress or require mental health support, please call the National Suicide Prevention Lifeline. The Lifeline provides 24/7, free and confidential support for people in distress and prevention and crisis resources for you or your loved ones.

You can reach the National Suicide Prevention Lifeline at 1-800-273-8255.

If you are in an emergency situation, please call 911.”

[COVID-19 Block]

COVID-19 is an infectious disease caused by the novel coronavirus. The next set of questions asks **how you have been affected by COVID-19.**

52. What do you think your chances are of contracting COVID-19?
- Low
- Moderate
- High

53. Do you consider yourself “high risk” for poor COVID-19 outcomes? How would you rate your level or risk?
- Low Risk
- Moderate Risk
- High Risk

54. Do you have family members or live in a household with individuals who are "high risk" for poor COVID-19 outcomes?
- No
- Yes

If Q54 is “Yes”:
54a. Are you a primary caregiver for any of these individuals?
- No
- Yes

55. Have any of your loved ones been diagnosed with, or been suspected of having, COVID-19?
- No
- Yes

56. Have any of your loved ones passed from COVID-19?
- No
- Yes

57. If you needed to, could you access COVID-19 testing?
- Yes
- No
- Unsure

58. Symptoms of COVID-19 include: fever, chills, cough, shortness of breath or difficulty breathing, new loss of taste and smell, body chest, sore throat, and fatigue. In the past year, have you experienced symptoms similar to those of COVID-19?
- Yes, 12-6 months ago
- Yes, 6-3 months ago
- Yes, 1-3 months ago
- Yes, some time in the past month
- Yes, currently
- No

59. Have you ever tested positive for COVID-19?
- No
- Yes, I tested positive for COVID-19 a while ago
- Yes, I am COVID-19 positive right now

60. Have you ever received treatment for COVID-19?
- No
- Yes, I received outpatient treatment (i.e., I saw a doctor or went to the ER)
- Yes, and I was hospitalized (i.e., stayed in the hospital for at least 24 hours)

Please read each statement below carefully and indicate the extent to which you agree or disagree with the following statements **with regard to COVID-19.**

61. I have difficulty integrating this event into my understanding about the world.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

62. This event is incomprehensible to me.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

63. I am perplexed by what happened.

- Strongly disagree

- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

64. Since this event happened, I don’t know where to go next in my life.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

65. I don’t understand myself anymore since this event.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

66. This event has made me feel less purposeful.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

[Attention Check]

67. Please answer the following math question. Put your answer in numerical format, like "10". What is 20 minus 3?

_____

[Coping Block]

We are interested in learning about the ways you've been coping with the stress in your life since the COVID-19 pandemic began. There are many ways to try to deal with problems. The next set of questions ask how often you use particular coping strategies. Don’t answer on the basis of whether it seems to be working or not -- just whether or not you’re doing it.

68. **How much have you been doing each of these?**

	I haven't been doing this at all (1)	I've been doing this a little bit (2)	I've been doing this a medium amount (3)	I've been doing this a lot (4)
I've been turning to work or other activities to take my mind off things.				
I've been concentrating my efforts on doing something about the situation I'm in.				
I've been saying to myself "this isn't real".				
I've been using alcohol or drugs to make myself feel better.				
I've been getting emotional support from others.				
I've been giving up trying to deal with it.				
I've been taking action to try to make the situation better.				
I've been refusing to believe that it has happened.				
I've been saying things to let my unpleasant feelings escape.				
I've been getting help and advice from other people.				
I've been using alcohol or other drugs to help me get through it.				
I've been trying to see it in a different light, to make it seem more positive.				
I've been criticizing myself.				

I've been trying to come up with a strategy about what to do.				
I've been getting comfort and understanding from someone.				
I've been giving up the attempt to cope.				
I've been looking for something good in what is happening.				
I've been making jokes about it.				
I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.				
I've been accepting the reality of the fact that it has happened.				
I've been expressing my negative feelings.				
I've been trying to find comfort in my religion or spiritual beliefs.				
I've been trying to get advice or help from other people about what to do.				
I've been learning to live with it.				
I've been thinking hard about what steps to take.				
I've been blaming myself for things that happened.				

I've been praying or meditating.				
I've been making fun of the situation.				
I've been using virtual methods of communication (such as speaking on the phone, video-chatting, or text messaging) to keep in touch with friends and family.				

[COVID Guideline Behaviors Block]

There are a number of recommendations that the CDC has issued to limit the spread of COVID-19.

69. Are you aware of what the current health guidelines are to limit the spread of COVID-19?

- No
- Yes

70. How confident are you in your ability to understand and follow the current guidelines aimed to limit the spread of COVID-19?

- Not at all confident
- Slightly confident
- Somewhat confident
- Fairly confident
- Completely confident

71. We would like to get a better understanding of how often you engage in the following behaviors. In the past **two weeks**, how often have you been able to . . .

	Never (1)	Rarely (2)	Sometimes (3)	Most of the time (4)	Always (5)
Work or engage in school from home					
Avoid gatherings of more than 10 people					

Maintain Social Distance (remaining at least 6 feet apart from other people, whom you do not live with, at all times)					
Cover your mouth and nose with a face cover (e.g., mask, scarf, or bandana) when in public					
Use delivery, drive-through, or pickup options to get food and groceries					
Avoid travel, shopping trips, and social gatherings					
Avoid in-person contact with high-risk individuals, such as the elderly and those with underlying medical conditions, whom you do not live with					
Wash your hands, especially after touching frequently-touched items or surfaces					
Clean and disinfect frequently touched surfaces daily					

72. Do you feel that the measures that you are taking to fight COVID-19 are making a difference?

- Definitely not
- Probably not
- Might or might not

- Probably yes
- Definitely yes

73. If you would like to share any other information about your experiences, thoughts, or feelings related to COVID-19 and how you are coping, please do so below.

_____
_____

_____

[End of Survey Block]

Thank you!

Thank you for taking part in this research study and sharing your experiences. **Please note that you must click through to the next page to fully complete the survey and be compensated.** Once you click through the next page, you will be automatically redirected back to Centiment. Only then will you be compensated for completing this survey.

Below we have compiled a list of resources that may be helpful to you or your loved ones during this time. These resources provide information on legal and financial aid, mental health care and medical care services, food and housing, and mutual and community resources.

You can also find this full list at:
https://drive.google.com/file/d/1zGC9XumG3o1dY3RGLgv4BBXvb2CAbfMq/view

We recommend that you save this Google Drive link for your reference. You may also email Emilia Mikrut, the corresponding investigator for this study, at emilia.mikrut18@stjohns.edu at any point in the future if you would like these resources to be sent to you again.

General Directories

1. Coronavirus Mutual Aid
   Description: Directory of state-city level mutual aid networks, along with national initiatives
   Link: http://tiny.cc/coronavirusmutualaid

2. COVID-19 Economic Relief
   Donations focused database, typically involving non-profits. Also includes links to national databases

Link: https://docs.google.com/spreadsheets/d/1WRuhm9iE8PSeMJdqcigpv84JjZ2g3N3_f2fx5C2gSxc/edit#gid=1687775913

3. Mutual AID Hub
   Description: directory of state-city level mutual aid networks, along with national initiatives
   Link: https://www.mutualaidhub.org/

4. COVID-19 MUTUAL AID & ADVOCACY RESOURCES
   Description: Directory of state-city level mutual aid networks, along with and safety during pandemic.
   Link: https://docs.google.com/document/d/1dpMzMzsA83jbVEXS8m7QKOtK4nj6gIUk1U1t6P4wShY/edit

Housing Resources

1. Fannie Mae Disaster Response Network
   Description: program that offers homeowners assistance and support
   Link: https://www.knowyouroptions.com/get-help-overview/disaster-recovery-help-for-homeowners

2. 211.org
   Description: Directory that links to variety of local resource orgs
   Link: http://211.org/services/essential-needs

3. NAA.org
   Description: Information for workers and renters
   Link: https://www.naahq.org/coronavirus-guidance

4. COVID-19 Community Response and Recovery Fund
   Description: Directory of United Way Chapters
   Link: https://www.unitedway.org/recovery/covid19/luw-responses?utm_source=fundpage&utm_medium=web&utm_campagin=covid19#

5. National Coalition for the Homeless
   Description: emergency housing, rent relief, and links to orgs
   Link: http://nationalhomeless.org/references/need-help/

6. Section 8
   Description: link to rental assistance application
   Link: https://section-8-application.onlinepacket.org/rental-assistance/

Food Insecurity

1. No Kid Hungry

Description: grant request form for providing children meals
Link: https://www.nokidhungry.org/coronavirus-grant-request

2. Feeding America
   Description: links for network of food banks and food assistance programs
   Link: https://www.feedingamerica.org/need-help-find-food

3. Meals on Wheels
   Description:
   Link: https://www.mealsonwheelsamerica.org/find-meals

4. 211.org
   Description: Directory that links to variety of local resource orgs
   Link: http://211.org/services/essential-needs

5. National Coalition for the Homeless
   Description: emergency housing, rent relief, and links to orgs
   Link: https://nationalhomeless.org/references/directory/

6. Umbrella
   Description: Home delivery of food, medical and other essential supplies
   Link: https://www.askumbrella.com/covid-response

7. Shopping Angels
   Description: grocery delivery service
   Link:
   https://docs.google.com/forms/d/e/1FAIpQLSd5FbvXqx3GlCZ1SlKOVs2LukraZr0VOyQWvbi5eRVPGSV1oA/viewform

8. Mutual Aid/Food/Supplies During COVID-19
   Description: Database of mutual aid/food supplies at the state level
   Link: https://docs.google.com/spreadsheets/d/1C9Emmohz_yMh-PG0pLvQjSKHbYhdGhWfBrjBFgIGHtc/edit#gid=0

Transportation

1. Need Help Paying Bills
   Description: programs providing free transportation/cars
   Link: https://www.needhelppayingbills.com/html/find_free_cars.html

2. Umbrella
   Description: Delivery of Essentials
   Link: https://www.askumbrella.com/covid-response

3. Shopping Angels
   Description: grocery delivery service

Link: https://docs.google.com/forms/d/e/1FAIpQLSd5FbvXqx3GlCZ1SlKOVs2LukraZr0VOyQWvbi5eRVPGSV1oA/viewform

Employment

1. Unemployment Gov't
   Description: apply for unemployment benefits, workers' compensation, welfare or temporary assistance
   Link: https://www.usa.gov/unemployment

2. RC United
   Description: Fund for financial assistance for Restaurant workers
   Link: https://rocunited.org/stop-the-spread/coronavirus-support/

3. Benefits.gov
   Description: lists of financial and healthcare benefit programs
   Link: https://www.benefits.gov/news/article/393

Financial

1. One Fair Wage
   Description: For restaurant workers
   Link: https://ofwemergencyfund.org/help

2. Restaurant Workers Community Foundation
   Description: For tipped and Service Workers
   Link: https://form.southernsmoke.org/smoke/application/

3. National Domestic Workers Alliance
   Description: for domestic workers
   Link: https://www.domesticworkers.org/

4. 211.org
   Description: Directory that links to variety of local resource orgs
   Link: http://211.org/services/essential-needs

5. HealthWell Foundation
   Description: for medical expenses
   Link: https://www.healthwellfoundation.org/patients/

6. Advoconnection
   Description: Healthcare Needs
   Link: https://advoconnection.com/non-profit-organizations/

7. Section 8

Description: link to rental assistance application
Link: https://section-8-application.onlinepacket.org/rental-assistance/

8. COVID-19 Treatment Relief Fund
   Description: Financial support for Medical Care
   Link: https://www.covid19affordhealth.org/

Utilities

1. 211.org
   Description: Directory that links to variety of local resource orgs
   Link: http://211.org/services/covid19

2. COVID-19 Community Response and Recovery Fund
   Description: Directory of United Way chapters
   Link: https://www.unitedway.org/recovery/covid19/luw-responses?utm_source=fundpage&utm_medium=web&utm_campagin=covid19#

3. Billsupport.org
   Description: post unpaid bills that are crowdsourced
   Link: https://billsupport.org/

Personal Safety & Legal Aid

1. National Domestic Violence Hotline
   Description: hotline for victims of domestic violence
   Link: https://www.thehotline.org/

2. National Coalition for the Homeless
   Description: locale directories of legal and mental health aid
   Link: https://nationalhomeless.org/references/directory/

3. domesticshelters.org
   Description: locale directories of legal and mental health aid
   Link: https://www.domesticshelters.org/help#?page=1

4. Legal Services Corp
   Description: director for legal advice and representation
   Link: https://www.lsc.gov/what-legal-aid/find-legal-aid

Mental Health Resources

1. NAMI
   Description: Links to a variety of Mental Health Resources
   Link: https://www.nami.org/Find-Support/NAMI-HelpLine/Top-HelpLine-Resources

2. Disaster Distress Helpline
   Description: crisis counseling and support
   Link: https://www.samhsa.gov/find-help/disaster-distress-helpline

3. CDC Resources for Stress and Coping
   Description: list of resources
   Link: https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/managing-stress-anxiety.html

4. Mental Health America
   Description: list resources and organizations
   Link: https://mhanational.org/covid19

5. Washington Area Intergroup Association
   Description: Online/phone meetings for people with Substance Use Disorders
   Link: https://aa-dc.org/online-meetings

Family and Community Support

1. Child Care Aware
   Description: search locally to find child care resources
   Link: https://www.childcareaware.org/resources/ccrr-search-form/

2. Localized Resources During COVID-19 Outbreak
   Description: short list of national/local community resources
   Link: https://docs.google.com/spreadsheets/d/1HEdNpLB5p-sieHVK-CtS8_N7SIUhlMpY6q1e8Je0ToY/edit#gid=1465132042

3. Shopping Angels
   Description: grocery delivery service
   Link:https://docs.google.com/forms/d/e/1FAIpQLSd5FbvXqx3GlCZ1SlKOVs2LukraZr0VOyQWvbi5eRVPGSV1oA/viewform

4. Little Brothers
   Description: Phone calls to isolated elderly
   Link: https://littlebrothers.org/

5. Mon-Ami
   Description: Phone bank for elderly people who are isolated
   Link: https://mon-ami.typeform.com/to/iBV2oR

6. Umbrella
   Description: delivery of essentials
   Link: https://www.askumbrella.com/covid-response

7. Neighborhood Support System
   Description: guide to creating neighborhood support system
   Link:https://docs.google.com/presentation/d/17SkvA_q2S1qEMoV0O2guvlyCvtavSOFYWt2UUcGo5e4/edit#slide=id.g8174de771a_0_11

8. Mutual Aid, Self & Community Resources
   Description: List of various community oriented resources
   Link:https://docs.google.com/document/d/1RMz_3arhWBaKAFEOeppscX64U6ta-QuF0RQNif1r608/edit#

9. Caregiver Action Network
   Description: Assistance/Information for Caregivers
   Link: https://caregiveraction.org/covid-19#

10. National Alliance for Caregiving
    Description: Hub for federal and local information for both patients and caregivers affected by COVID-19
    Link: https://www.caregiving.org/resources/covid-19-resources-for-caregivers/

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Vita

Name	*Emilia Eva Mikrut*
Baccalaureate Degree	*Bachelor of Arts, Hunter College, City University of New York, New York* *Major: Psychology, Interdisciplinary Studies*
Date Graduated	*May, 2018*
Master's Degree	*Master of Arts, St. John's University, Queens* *Major: Clinical Psychology*
Date Graduated	*September, 2020*