

Adaptation to COVID-19: Through the Lens of Coping and Defense Mechanisms

by

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Abstract

The COVID-19 pandemic is an ongoing stressor. One way people adapt to stressors is through the deployment of coping and defense mechanisms. Initially thought to be the same process, coping and defense mechanisms are theoretically unique variables affecting stress outcomes (Cramer, 2008; Kramer, 2010). Practically speaking, defenses and coping have been assessed through several measures and statistical approaches, including regression analysis (Vally et al., 2020), longitudinal analysis (Diehl et al., 2014), and factor analysis (Maricutoiu & Crasovan, 2016). The study sought to assess differences between coping and defenses through adjustment to the COVID-19 pandemic while also assessing how rumination and social support may mediate/moderate relationships. We utilized a sample of 695 participants over the age of 18. Using descriptives, correlations, multiple regressions, and moderation analysis using the Hayes PROCESS macro, results from the study confirm that coping and defense mechanisms are statistically significant, unique variables affecting both psychological and functional impact of COVID-19. Coping and defense use increased with COVID-19 impact regardless of type. COVID-19 distress increased with psychological impact, functional impact, and exposure to COVID-19. The discrepancy between psychological impact and functional impact was not predicted but suggests the effects of COVID-19 are more complex than expected. There are patterns of specific defense and coping activation that predict psychological impact, functional impact, and rumination. This study found evidence that rumination partially mediates the relationship between COVID-19 psychological impact and overall defensiveness, Emotion-

Focused coping, and Avoidance coping. This study concludes that coping and defenses are two unique variables with varying patterns of activation through COVID-19 Distress, psychological impact, functional impact, exposure, presence of rumination, and to a smaller degree, rumination.

Both coping and defenses should be assessed in future research on adjustment to COVID-19.

Keywords: COVID-19, adaptation, stressors, coping, defenses, psychological impact, functional impact, rumination, social support, distress

Chapter I

Adaptation to COVID-19: Through the Lens of Coping and Defense Mechanisms

Humans face a variety of external events that create stress. Such events require humans to adapt. However, not everyone adapts effectively or in the same way; individual differences exist in adaptation. Historically, to understand these differences, psychologists have put forth theories of adaptation focusing on both implicit and explicit aspects of adaptation. Some individuals may adapt to stress as a function of mature unconscious mental mechanisms (i.e., defenses). Others, however, may adapt as a function of conscious efforts to cope. The present study examines the role of both explicit coping and non-conscious defending in adjustment to a major stressor, the COVID-19 pandemic. Specifically, we assessed if a measure of psychological defenses and a measure of conscious coping each contribute to impact of COVID-19, rumination during the pandemic, and use of social support during the pandemic. Finally, we extend prior research examining COVID-19 and adaptation (Walker & McCabe, 2021) by examining if access to social support moderates associations between indexes of adaptation (coping and defenses) and subjective impact of COVID-19.

What are Psychological Defenses

Psychological defenses, or defense mechanisms, are defined as unconscious, dispositional psychological processes dedicated to protecting self-esteem and preventing excessive anxiety (Cramer, 2008). These defenses are a large part of everyday functioning and serve people in times of high stress, disappointment, and strong, negative emotional experiences (Cramer, 2008). Defenses exist on a spectrum ranging from immature and problematic to mature and

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adaptive. Young children utilize immature defenses, which is developmentally appropriate. As the child matures, they increase the use of more adaptive defenses (Cramer, 2008).

Phoebe Cramer (2008) has developed a theory of defense mechanisms involving seven pillars. Cramer's seven pillars are as follows: defenses functioning outside of awareness, the chronology of defense development, defenses present in the normal personality, increases in defense use under stress, reduction of negative affect with defense use, the connection of defenses to the autonomic nervous system, and excessive use of defenses associated with psychopathology (Cramer, 2008). Using these pillars, she presents a number of key points about defenses. Cramer argues defense mechanisms are unconscious (2008). Just as blood clotting and coughing are involuntary ways the body protects itself, defenses are the mind's way of unconsciously protecting itself. Use of defense mechanisms is dependent on cognitive development. As individuals mature, they become more capable of using sophisticated defenses. Thus, specific defenses are considered appropriate for different stages of life. For example, it is developmentally appropriate for a two-year-old to utilize the defense of denial (an immature defense mechanism). When a 44-year-old regularly utilizes the defense of denial, this is a sign of psychological immaturity (Cramer, 2008).

Historically, defenses were studied in relation to psychopathology. They are now viewed as an integral part of everyday functioning (Cramer, 2015). Adults who regularly utilize mature defenses are well-adjusted and more likely to possess positive characteristics such as high self-esteem, empathy, outgoingness, and a more secure attachment style (Cramer, 2008). Conversely, adults relying heavily on immature defenses experience lower levels of self-esteem, higher patterns of self-centeredness, later-life maladjustment, and an overall tendency towards anxiety (Cramer, 2008). It has been found that IQ may have a relationship with the effect of defense use

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in a person's life; those with high IQ benefit from mature defense use and struggle with immature defense use. However, for those with lower IQ, even immature defense use may have more positive impacts on their lives (Cramer, 2008; Cramer, 2009; Vaillant & Davis, 2000).

Defense Mechanisms and Psychopathology. Excessive, reactive use of defenses in daily life is linked to greater risk for psychopathology compared to appropriate, moderate use (Cramer, 2008). Certain psychological disorders involve specific defense mechanisms (Cramer, 2008). For example, Vaillant (1994) followed a cohort of middle school boys for 35 years (Glueck & Glueck, 1950; Vaillant, 1983). Participants were regularly assessed for global psychiatric impairment, meeting thresholds of diagnostic criteria for personality disorders, and use of defense mechanisms. Defense mechanisms were conceptualized on a point scale of 1 being immature and 9 being mature defense mechanisms. The adaptive defense mechanism of suppression was linked with mental health as a whole. Specific defenses like projection, disassociation, and acting out were associated with antisocial and narcissistic personality disorders. Schizoid personality disorder was linked with the defense of fantasy (Vaillant, 1994).

Similar findings have been obtained using self-report measures assessing defensive styles. For example, Granieri et al. (2017) conducted a study on a non-clinical sample of Italian adults assessing the relationship between defense mechanisms and the *Diagnostic and Statistical Manual of Mental Disorders 5th edition* (DSM-5; American Psychiatric Association, 2013) maladaptive personality domains. The Defense Style Questionnaire-40 (DSQ-40; Andrews et al., 1993) was used to measure defenses and the Personality Inventory for DSM-5-Brief Form (PID-5-BF; Krueger et al., 2012) to assess maladaptive personality traits. Immature defense mechanisms were significantly associated with maladaptive scores in personality domains. Defenses such as reaction formation, pseudo-altruism, isolation, displacement, and projection

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were positively associated with the maladaptive personality traits of avoidant, schizotypal, borderline, and obsessive-compulsive personality disorders (Granieri et al., 2017).

Jun et al. (2015) explored the idea of defense mechanisms and psychopathology in a sample of North Korean refugees. The researchers used a Korean translation of the Defense Style Questionnaire (K-DSQ; Cho, 1999), a Korean version of the Center of Epidemiological Studies-Depression Scale (CES-D; Cho & Kim, 1998) for depressive symptoms, the State Trait Anxiety Inventory (STAI; Spielberger, 1983) for anxiety symptoms, the Symptom Checklist 90 Revised (SCL-90-R; Derogatis & Cleary, 1977) somatization subscale for somatization, and the Impact of Events Scale Revised (IES-R; Weiss & Marmar, 2004) for psychological distress related to a specific traumatizing event. Maladaptive defense styles were associated with the presence of psychopathology. Depression was linked to the defense of resignation. Anxiety was linked to acting out, reduced use of humor, and sublimation. Somatization was linked with inhibition. PTSD was linked with undoing and isolation (Jun et al., 2015).

This line of research further supports Cramer's assertion that defense mechanisms are associated with psychopathology in meaningful ways. Though the concept of defenses has been linked to psychopathology since its inception, modern theorists (e.g., Cramer, 2008) assert that links between use of defenses and psychopathology depend, in part, on management of stress. In other words, how the individual utilizes defenses to manage stressful life situations affects the individual's overall outcomes related to psychopathology.

Pillar IV: Defenses and Stress. The connection between defenses and psychopathology is impacted, in part, by the links between stress and defenses. In Pillar IV, Cramer (2008) makes two claims regarding the relationship between defenses and stress. First, exposure to stress increases the frequency of use for defense mechanisms. Second, elevated stress reduces the

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quality of defenses employed. In other words, intense stressors and/or long periods of stress are likely to result in the individual using less adaptive defenses (relative to the ones they employ when under less duress). Additionally, adults who excessively use defenses and/or habitually utilize immature defenses are more vulnerable to stress, which increases risk for psychopathology (Cramer, 2008). A number of studies have examined each aspect of this pillar.

Does increased stress result in an increase in use of defenses? To explore this question, Cramer conducted experimental studies on elementary school students (Cramer & Gual, 1988) and college students (Cramer, 1991a). In one study (Cramer & Gual, 1988) with school-aged children an experimental procedure was used to induce stress. Participants played a game with a marble and were asked to beat a standard time. Children who beat it had their names placed on a success board. Those who failed were not included on the board. The manipulated variable was the time required for success. For participants in the control condition, the time was very easy to beat. For those in the experimental condition, the time was impossible to beat. Thus, those in the experimental condition were induced to experience stress. As part of the study, the children also told stories to Thematic Apperception Test (TAT; Murray, 1943) cards. All participants did so before and after the game. Defenses were coded using Cramer's Defense Mechanisms Manual (DMM; Cramer, 1991b). Cramer and Gual (1988) found that use of defenses did not differ for the stories prior to the task; however, the stories told by children in the experimental group *after the task* evidenced more frequent use of denial and projection (compared to the stories told by children in the control group). Inversely, the stories of children in the control group involved higher levels of the mature defense of identification.

Having demonstrated that stress affects the frequency and quality of defense use in children, Cramer (1991a) sought to determine if this pattern would generalize to adults by

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randomly assigning college students to an experimental condition (stress induction) and a control condition. All participants told eight stories in response to TAT pictures. However, those in the experimental condition were criticized by the examiner *after their fourth story* and continued to chastise them for the final four stories. Participants in the control group were never criticized. Blind, expert raters coded the stories for denial, projection, and identification using the DMM. Defenses did not vary across the two groups for the first four cards; however, the stories of the experimental group showed more frequent use of denial and projection (relative to the control group) for the final four cards. Like the prior study with school-age children, this study suggested that increased stress resulted in more frequent use of less mature defenses. Further, it extended prior work by showing that the pattern held even among adults (Cramer, 1991a).

While Cramer's studies demonstrate that stress increases defense use and promotes the use of less adaptive defenses, they rely on experimental induction. It is unclear if these patterns would generalize to real world settings. Further, the DMM only codes for three defenses. Given there are more than three defenses, it is possible her results would not generalize to studies measuring additional defenses. Other researchers have addressed these limitations. For example, Araujo et al. (1999) examined associations between defenses and stress in adolescents facing significant challenges. The Defense Style Questionnaire (DSQ; Bond et al., 1983) was used to assess defenses and the Family Inventory of Life Events and Changes, Adolescent form (A-FILE; McCubbin et al., 1983) used to assess life stressors. Adolescent girls who experienced more life stressors used more immature defense mechanisms. However, instead of all types of defenses increasing with life stress, mature and prosocial defenses remained constant while 7 of the 12 immature defenses increased (in terms of frequency of use). What this means is that during periods of high stress, the defenses a person was using prior to the high stress were

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boosted along with an increased reliance on less developed, immature defenses (Araujo et al., 1999).

Research with adult samples also suggests links between defenses and stress in real world settings. Nickel and Egle (2006) examined how childhood adversity and defenses impacted psychopathology in adulthood. A German version of the Defense Mechanism Inventory (DMI; Hentschel et al., 1996) was used to assess defenses, a clinical interview for childhood adversity, and a German version of the Symptoms Checklist (SCL-90-R; Franke, 1995) for psychological distress. As expected, immature defenses were associated with greater psychological distress. Childhood adversity, such as physical and/or sexual abuse, was related to immature defense use and somatization (Nickel & Egle, 2006). Fang et al. (2020) and Merlo et al. (2021) also support Cramer's (2008) idea that stressors/psychological distress are related to the increased use of immature defense mechanisms.

Others have also found defenses to be related to stress in real-world situations. For example, Nicolas et al. (2017) examined use of defense mechanisms in a sample of French athletes prior to and after competition. They also assessed use of coping strategies, subjective stress, and perceived control. Using non-hierarchical cluster analysis, two clusters of defense styles were identified (i.e., a high defense use group and a low defense use group). Those in the high defense use group reported more frequent use of coping strategies and higher levels of stress before and after the competition. In short, these data indicate that athletes experiencing higher levels of stress were also more likely to utilize a range of psychological defenses (Nicolas et al., 2017).

Cramer (2008) argues the use of the defense mechanisms is linked to lower levels of perceived distress/negative emotions (i.e. anger, anxiety) related to a stressful event. This is

purely protective in nature and seems consistent across the lifespan. Despite this decrease in experience of distress, autonomic nervous system activation related to stress may still be present even with the suppression of those negative emotions (Cramer, 2008). Physiological changes such as elevated blood pressure, heart rate, and skin conductance are associated with elevated stress levels and increased use of defense mechanisms as well (Cramer, 2008; Nackley & Friedman, 2021).

Coping Mechanisms

One area closely linked to the concept of defense mechanisms is the psychological process of coping mechanisms. Lazarus and Folkman's (1984) definition, theory, and development of coping mechanisms is one of the most widely used and respected conceptualizations in the field of psychology. According to Lazarus and Folkman (1984), coping is defined as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p. 141). With this particular definition, coping mechanisms can be viewed as process-oriented strategies a person intentionally utilizes when they feel resources are inefficient in the face of a stressor. Unlike defenses, coping mechanisms are consciously initiated (Cramer, 2008). The person is aware that they are experiencing distress and efforts to cope are organized around an attempt to reduce the direct or indirect impacts of this stress/distress on the individual. Like defenses, coping mechanisms are activated by the perception of threat. "Threat" itself is defined as "harm or loss[es] that have not yet taken place but are anticipated" (Lazarus & Folkman, p. 32). A key feature of this model is that threat is appraised somewhat subjectively. In the first phase, the person identifies a stimulus as threatening, desirable, or neutral. When a stimulus is deemed threatening, the second phase is initiated in which the person assesses their

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capacity for coping. Thus, two people may experience the same stimulus differently (due to different beliefs about their capacity to manage the stressor). For example, two individuals stumble on a snake during a hike. One person has never handled snakes in any capacity, while the other person works at a local reptile sanctuary. While the first individual may assess the stressor as something they cannot handle due to their inexperience and fear around the snake, the second individual will not experience elevated stress responses because they believe they can appropriately manage the situation without exceeding their current abilities. Thus, a person's belief they can handle a situation affects how often they engage in coping and what kind of coping they may engage with based on this evaluation.

Furthermore, Lazarus and Folkman (1984) define two primary forms of coping. The first, emotion-focused coping, is the more likely coping strategy a person may use when they are unable to control the perceived threat in the environment. It centers around cognitive processes within the acute, emotional distress a person is feeling in an effort to regulate them. A person may actively make themselves feel worse by increasing psychological distress through self-punishment or self-blame. This may be in an effort to change the meaning of the stressful event; by changing the meaning through emotion-focused coping, a person experiences cognitive reappraisal of the situation that caused the distress in the first place. Despite this, cognitive reappraisal is not always the end goal of emotion-focused coping but a possible by-product of certain behaviors, such as exercising, eating, meditating, or seeking emotional support. The second form of coping is problem-focused coping. This coping strategy is more likely to be used when a situation is within a person's control for change. It is more analytical and environmentally-focused in nature compared to emotion-focused coping. Additionally, problem-

focused coping may be directed on the environment, like removing barriers or changing procedures of events, or the self, such as changing aspirations or behavior standards.

How are Psychological Defenses and Coping Mechanisms Different?

To understand the goals of this paper, time needs to be dedicated to establishing the differences between defenses and coping mechanisms. Cramer (1998) has repeatedly argued that defenses and coping mechanisms can be differentiated. While both share the goal of reducing internal distress and/or anxiety to protect the individual, there are key differences: conscious vs. unconscious initiation, internal vs. external impacts, hierarchical organization, and dispositional vs. situational onset.

The most prominent difference lies in the idea of conscious versus unconscious. Cramer (1998) proposes that coping mechanisms are active forms of engagement a person does to reduce negative affect, while defense mechanisms are largely unconscious and happen outside of a person's awareness. This delineation involves the concept of intent. Action with intent to change describes coping mechanisms, while action without intent, i.e. without conscious choice, describes defenses. While some coping behaviors have been noted to happen without intent, such as habitual coping, this brings up the issue of their classification as coping mechanisms in the first place (Suls & David, 1996; Tennen & Affleck, 1997). The struggle to define certain concepts as either defenses or coping mechanisms continues to be a debated topic within psychology.

In addition, defenses are only focused on changing internal states, whereas coping mechanisms can change internal or external states depending on need and situation (Cramer, 1998). For example, imagine an individual with a family to support. This person has been having difficulties at home managing unexpected expenses and is currently struggling to pay monthly

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bills fully and on time. With this financial strain and the added responsibility of providing for their family, this person is under a high level of stress. According to the theories discussed in previous sections, this person is going to rely on both coping and defense mechanisms to help them manage their elevated negative affect. To change their external state, i.e., the environment around them, they might engage in problem-focused coping and pick up extra shifts at work to help compensate for the financial burden they currently face. Conversely, they may engage with defense mechanisms such as humor, rationalization, or even denial to manage their internal state, i.e., their current psychological state. While the coping mechanism is a conscious choice the person makes to assist in reducing negative affect and increase their sense of control over their situation, the defense mechanisms they use would be unconscious and may not be oriented around perceived control.

In addition to conscious versus unconscious actions and intent, defenses and coping mechanisms are different through Cramer's (1998) inclusion of the idea of hierarchical organization. Defense mechanisms are repeatedly organized in a hierarchical fashion according to factors such as age, maturity, and cognitive complexity. Coping mechanisms are almost never organized in such a way and are instead seen as more dimensional in nature. While these distinctions in organization are not absolute, they do mark a core change in understanding the differences between the two processes.

Another major difference between defenses and coping mechanisms Cramer (1998) outlined is within the concept of dispositional processes or situational ones. Defenses are dispositional and thought to be consistent and stable across the lifespan regardless of outside factors. Comparatively, coping mechanisms are situationally dependent. There is evidence to suggest otherwise; additional research is needed to understand the accuracy of such a division

between dispositional and situational processes. Cramer (1998) argues it is more likely that some defenses are situationally dependent while some coping mechanisms may be dispositional. The key idea driving this gray area is the distinction between individual differences and how to account for them in research.

Research on Coping and Psychological Defenses

While there is considerable evidence supporting Cramer's (2008) contention, not all research aligns with her perspective. For example, in a review of more recent research, Kramer (2010) notes that some defenses are more conscious and some coping mechanisms operate unconsciously. Kramer (2010) also challenged the argument that coping mechanisms are more situational and defenses are more dispositional, arguing that a typical defense profile is subject to fluctuation depending on where the conflict is stemming from, i.e., internal or external. This results in a disparity between the theoretical basis of defenses versus coping compared to the empirical evidence associated with defenses and coping. This section seeks to establish empirical evidence examining the relation of the theoretical foundations of Cramer's (1998) evidence to tried and tested research in the field.

Regression Analysis. One of the ways researchers assess the relationship between two constructs such as coping and defenses is through regression analysis. Vally et al. (2020) examined problematic internet usage, coping, and defenses in a sample of Middle Eastern young adults. Researchers used online, self-report measures to gather their data. They employed the Brief COPE form (Carver, 1997) to assess coping style and a short form of the Defense Style Questionnaire (DSQ; St. Martin et al., 2013) for defenses. Additionally, problematic internet usage was measured using the Problematic Internet Use Questionnaire-9 (PIUQ-9; Koronczai et al., 2011), depression was measured with the brief version of the Centre for Epidemiological

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Studies Depression Scale (CESD-10; Andresen et al., 1994), and self-esteem using the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965). The primary regression used was hierarchical regression analysis separated into three steps: first, the psychopathological variables of depression and self-esteem; second, defense styles; and third, coping strategies.

Psychopathological variables were not predictive of problematic internet use. Defenses, specifically mature, immature, and autistic fantasies, contributed a significant amount of variance. Coping mechanisms, entered on the final step, also accounted for significant variance in the prediction of problematic internet use above and beyond that accounted for on earlier steps. The different amount of unique variance predicted by the different steps in the hierarchical regression illustrates how coping and defenses can act as two separate constructs (Vally et al., 2020).

Another study considered the effects of paternal relations on defenses and coping mechanisms in breast cancer patients (Renzi et al., 2017). This study sought to understand how parental relations, specifically a woman's relationship with her father, affected emotion regulation during a period of high stress associated with a breast cancer diagnosis. Additionally, it sought to understand how these parental relations were associated with defense use and coping mechanisms, and how this would affect behavioral/emotional regulation related to a cancer diagnosis. The researchers recruited a sample of hospitalized women with breast cancer coming in for breast cancer surgery. They used an ANCOVA approach to study their hypothesis and confounding variables such as type of treatment being administered, cancer prognostic factors, and individual factors like age, family history, and BMI were controlled for statistically. The results of this study suggest that defenses and coping strategies were related to one another. Immature, maladaptive defenses were positively associated with coping styles such as avoidance

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and hopelessness/helplessness. Mature, adaptive defenses were inversely associated with the same coping styles and positively associated with fatalism and fighting spirit. This means that those who used more mature defenses did not deploy as many avoidant coping skills, while those who used less mature defenses used more avoidant coping skills. If the two variables were the same, the researchers would have expected to see no difference between deployment of coping and defenses. This study further supports how defenses and coping styles are linked through utilization during periods of high stress while also showing how they differentially affected stress outcomes (Renzi et al., 2017).

This line of research has further been supported by other studies. Prout et al. (2020) sought to assess psychological predictors of distress during COVID-19. The researchers focused on identifying variables most salient to distress. They utilized a variety of measures to do so, including the Adverse Childhood Experiences Questionnaire (Felitti et al., 1998) to assess childhood trauma, the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) for coping, the Defense Mechanisms Rating Scale-Self Report (DMRS-SR-30; DiGiuseppe et al., 2020b) for defenses, the Patient Health Questionnaire (PHQ; Spitzer et al., 1999) for depression and anxiety, and the Impact of Event Scale-Revised (IES-R; Weiss and Marmar, 2004) for distress. Researchers used regression trees to compare to the random forest algorithm they implemented to examine their hypothesis. Rates of depression, anxiety, posttraumatic stress symptoms (PTSS), and distress were higher than noted in previous years and pandemics, like the SARS (Severe Acute Respiratory Syndrome) pandemic. Additionally, it was found that “individuals who struggle to deal with pandemic-related stressors in adaptive ways, by relying more on somatization and less on adaptive defenses, may be more vulnerable to developing psychiatric symptoms” (Prout et al., 2020, p. 10). Essentially, the researchers found that people

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who relied on the emotional regulation (coping) strategy of somatization and employed immature, unadaptive defenses were at higher risk of developing depression, anxiety, or PTSS and experiencing more subjective distress. Each of these factors accounted for a unique amount of variance (Prout et al., 2020). This study supports coping and defenses being unique, independent variables through differences in stress outcomes based on the utilization of emotion-focused coping versus immature/mature defenses.

Longitudinal Studies. Longitudinal research considered how coping mechanisms and defense use change over time. Although early research yielded mixed results, Diehl et al. (2014) used both a time-invariant (covariate of socioeconomic status [SES]) and a time-varying (covariates of ego level, verbal ability, and inductive reasoning) series over the course of a twelve year period with multiple times of measurement. They examined linear and quadratic change trajectories. The researchers also considered gender related changes in coping versus defense growth/maturation. Data was collected in 1992, 1994, 1998, and 2004 from an original sample of 392 European-Americans. The final sample size at Time 4 was 171. Data was collected through a series of 2 hour sessions that were scheduled about two weeks apart. Coping and defenses were measured with the California Psychological Inventory (CPI; Gough, 1987), ego level with the short form of Loevinger's Washington University Sentence Completion Test (Hy & Loevinger, 1996), verbal and inductive reasoning with the vocabulary and letter sets test from the Educational Testing Service (ETS) Kit of Factor-Referenced Cognitive Tests (Ekstrom et al., 1976), and SES calculated using household income and father's education level as reported during Time 1 (Diehl et al., 2014).

Diehl et al. (2014) tested the unconditional means model to illustrate systematic within and between-person variability, while testing the unconditional growth model was person

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specific with time as the only predictor. Time was then equated with participants' age and centered a grand-mean of 45.35 years at Time 1. This unconditional growth model was split into two leveled equations (level 1 and 2) to compensate for the differences being measured. The level 1 equation examined possible nonlinear age-related growth trajectories of coping strategies and defense mechanisms while the level 2 equation sought to examine gender differences. SES was added into the level 2 equation as the time-invariant covariate. Ego level, verbal ability, and inductive reasoning were added as time-variant covariates into the level 1 equation to see how they may affect changes in coping and defense use (Diehl et al., 2014).

Results of the within-persons variability versus between-person variability show that defense mechanisms and coping strategies change over time on the individual level and systemically over the lifespan. Ego level was the only covariate predictive of age-related change in coping and defenses. Specific coping mechanisms such as sublimation and suppression increased for individuals who were in young to middle adulthood but decreased during late adulthood (60-65 years of age). For defenses, specifics such as doubt, regression, and displacement decreased within individuals starting in young adulthood until middle age/early old age. The results also showed that men and women's general patterns of coping and defense use changed similarly over time, but specifics such as intellectualization for defense and suppression for coping did have unique patterns based on the gender of participants. Overall, the study's results suggest that changes in coping and defense use over the lifespan is non-linear in nature, but coping and defenses maintain distinctions as unique constructs with different patterns of growth between and within individuals (Diehl et al., 2014). In short, the varying patterns of change over time support the notion that defense mechanisms and coping strategies are different as they follow different growth trajectories.

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Another article of interest pertained to Mars missions. Nicolas et al. (2013) examined defenses, coping, emotions, and depression in relation to ICE (Isolated and Confined Extreme) environments. Sample size was limited to 6 male participants (due to the cost of the study). The researchers simulated actual space flight apart from the microgravity. It lasted 105 days. Baseline was gathered at three points prior to the experiment; ICE was gathered at six points during the simulated mission; post-ICE data was gathered at three points after the simulated mission. Researchers used the COPE (Carver et al., 1997) for coping and the DSQ (Andrews Singh, & Bond, 1993) for defenses. The researchers also measured emotional state. A main effect was found for emotion, with a significant decrease in positive emotions over the course of ICE. Results indicate that coping strategies on the task-oriented dimension of the construct were associated with mature defense use. In contrast, immature defenses were associated with disengagement-oriented coping (a less adaptive form of coping). Overall, while the findings suggest that coping and defenses are related concepts that are both linked to adaptation, they also found evidence they are separate. The researchers concluded:

The simultaneous investigation of coping strategies and defense mechanisms has proven to be the most fruitful path for studying adaptation and may improve understanding of the complex and dynamic ways in which participants such as space flyers deal with the demands of constraining situations. (Nicholas et al., 2013, p. 56-57).

This further supports the notion for studying both coping mechanisms and defenses when looking at responses to stress.

In a similar vein, Nicolas et al. (2016) sought to understand how coping and defenses were related over time. Unlike Diehl et al. (2014), this study used a two-waved cross-lagged panel design with a sample of athletes. It took place over a series of competitive sports events.

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Data was collected no more than 2 hours before the event and no more than 2 hours after the event ended. Researchers used the Coping Inventory for Competitive Sport (CICS; Gaudreau & Blondin, 2002) to study coping, and the Defense Style Questionnaire (DSQ; Andrews et al., 1993) for defenses. They used partial least squares path modeling (PLS-PM) with latent variables to study this relationship. Overall, the researchers found both distinctions and relationships between defenses and coping strategies. Specifically, they found that defense mechanisms influenced use of coping strategies, and defenses were related to use of coping strategies in theoretically relevant ways. For example, the use of mature defenses was associated with the use of adaptive coping strategies (e.g., reframing; using planning) prior to competition, while the use of immature defenses was associated with the use of less adaptive coping strategies (e.g., avoidance; distancing). Findings were interpreted as supportive of the position that defenses and coping strategies are conceptually separate, even though both are aspects of adaptation. The researchers conclude “There is a need to assess simultaneously coping strategies and defense mechanisms to improve our understanding of the complex and dynamic ways in which individuals deal with the demands of stressful situations” (p. 150).

Factor Analysis. Maricutoiu and Crasovan (2016) examined differences between defenses and coping in a sample of Romanian adults. The researchers examined Cramer’s (1998) and Kramer’s (2010) theory by comparing Structural Equation Models (SEM), or a combination of factor analysis and regressions; one model assumed defenses and coping strategies were independent while the other assumed they were not independent. For the construct of coping, the researchers used the COPE scale (Carver et al., 1989). For defenses, they used the Defense Style Questionnaire-60 (DSQ-60, Thygesen et al., 2008). Correlations between DSQ-60 scales and COPE scales tended to be small to moderate (none exceeded .30). The authors interpreted this as

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evidence that the constructs may be related, but are conceptually distinct. The SEM model comparisons, however, suggested that models assuming the latent factors for coping and defenses were associated tended to produce better fit compared to those assuming they were independent. When synthesizing the findings, the authors asserted limited effect sizes between the COPE and DSQ-60 scales support Cramer's (2016) argument that the constructs are unique, while the SEM models support Kramer's (2010) assertion that the two affect one another and serve a similar function (i.e., adapting to stress and challenge). What this suggests is the constructs are independent but do possess similarities (Maricutoiu & Crasovan, 2016).

A limitation of Maricutoiu and Crasovan's (2016) study is that it relies solely on scale correlations to assess conceptual independence. Others have examined this hypothesis using more statistically sophisticated factor analytic methods. Muris et al. (1995) used a college student sample and sought to understand how dimensions of coping and defenses were related to each other. Researchers used the COPE (Carver et al., 1989) and the DSQ (Andrews et al., 1989) to measure coping and defenses respectively. Results from a principal components analysis yielded three distinct factors: the first factor loaded on Immature and Problem-Avoiding Coping and Defenses; the second factor loaded onto Emotion-Venting Coping and Defenses; and finally, the third factor loaded onto Mature and Problem-Oriented Coping and Defenses. Overall, this pattern supports the idea that coping and defenses are two independent constructs, while also highlighting an area of interdependence with their mutual activation with stress (Muris et al., 1995). While the results of this study are important, it's also important to note how this methodology relies on chance through exploratory analyses compared to confirmatory. This study also illustrates how entwined these two variables are with each other, where activation of one appears to trigger activation of the other.

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Similarly, Eriksen et al. (1997) sought to create a short battery to assess coping, defenses, and general health through testing within a Scandinavian population. Researchers measured coping through the Utrecht coping list (Schreurs et al., 1993), defenses through the Defense Mechanisms Inventory (DMI; Gleser & Ihilevich, 1969), and health complaints through the Ursins Health Inventory (UHI; Ursin et al., 1988). Researchers then ran principal components analysis using their coping and defense measures. Results suggested four factors: defensive hostility, instrumental mastery-oriented coping, cognitive defense, and emotion-focused coping. Overall, this factor analysis also supported the idea of coping and defenses being independent constructs with four factor loadings based on the measures the researchers used (Eriksen et al., 1997).

Despite the support research has provided, there have been instances of unclear or contradictory results when looking through factor analysis. For example, Zhao and Ding (2019) sought to understand the relationship between coping, defenses, and burnout symptoms in university professors. Researchers used the Coping Inventory for Stressful Situations (CISS; Endler & Parker, 1999) for coping, the Lifestyle Index (Conte & Plutchik, 1995) for defenses, and the Maslach Burnout Inventory—Educators Survey (MBI-ES; Maslach & Jackson, 1986). Like previous studies, researchers chose to use a principal components analysis to compare all three measures and see what factors yielded. The results indicated that, with the inclusion of burnout, coping and defenses fell onto the same factor and yielded a one-factor solution accounting for 23.7% of total variance. The authors of the paper listed a variety of limitations including issues with causality between burnout and defenses employed, lack of accounting for possible covariates, and lack of specificity with participants' positions (Zhao & Ding, 2019). It seems possible that the inclusion of a factor like burnout may change how each individual

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construct accounts for total variance. As coping and defenses appear to often be hanging together (Muris et al., 1995), this result may be a confirmation of interdependence between the variables instead of expected levels of independence based on theory. Additionally, the model accounted for a limited total amount of variance. While the findings did not provide obvious support for the notion that defenses and coping strategies are unique constructs, methodological and statistical issues render this study hard to compare to other factor analytic studies.

While prior studies have found overlaps between the constructs of coping and defenses, it seems like each construct predicts a unique amount of variance in times of stress. Because of this, the present study aims at understanding the relationship between coping and defenses with the stressor of the novel COVID-19 global pandemic.

The Stressful Impacts of COVID-19

With the declaration of COVID-19 as a global pandemic, COVID-19 itself and its effects can be considered stressors affecting people systemically and on an individual level (Bridgland et al., 2021). It's important to understand how people react to a stressor in conceptualizing reactions to COVID-19. Lazarus and Folkman's (1984) transactional model of stress and coping enables one to understand the steps a person takes in response to stress and how important coping is to it. Stressors themselves have categories such as major life events and daily hassles. Major life events can be expected (i.e., death of a parent) or unexpected (i.e., natural disaster) and are typically larger than daily hassles. Daily hassles themselves are smaller relative to major life events and more annoying, irritating, or distressing. Both major life events and daily hassles have impacts on a person's adaptation and health despite the apparent difference in magnitude (Lazarus & Folkman, 1984). Within the context of this paper, defense mechanisms are thought to play a powerful role in how people respond to stress as they are conceptualized as a separate

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construct from coping mechanisms, albeit with similar goals (Cramer 1998; Kramer, 2010; Muris et al., 1994; Eriksen et al., 1997; Maricutoiu & Crasovan, 2016; Diehl et al., 2014; Vally et al., 2020; Nicolas et al., 2017). Using Lazarus and Folkman's model (1984), COVID-19 can be seen as an unexpected stressor that may cause stress through an increase in major life events and daily hassles.

General Impacts of COVID-19. COVID-19 has affected over 224 million people with a death count of 4.6 million at the time of this paper (World Health Organization, 2021). Major stressors of COVID-19 include duration of quarantine, fear of infection, frustration, boredom, lack of proper supplies (such as food, water, clothes, housing, personal protective equipment, etc.), absence of personal space/meaningful social interactions, and inadequate information (Brooks et al., 2020). Historically, pandemics or outbreaks requiring quarantine have increased overall levels of psychological distress, including areas like emotional disturbance, low mood, anger, stress, depressive/anxiety symptoms, irritability, insomnia, and PTSD-like symptoms (Brooks et al., 2020; Lopez et al., 2020). With COVID-19, research indicates it has affected all domains of life, including financial, social, mental, emotional, and physical (Bridgland et al., 2021). Similar patterns of low mood, irritability, confusion, anger, and fear have been found in preliminary research into the effects of COVID-19 (Brooks et al., 2020). Regarding psychopathology, COVID-19 related traumatic stressors appear to be related to increased rates of general psychopathology, depression, anxiety, PTSD, and decreased rates of completion for training/education and daily tasks (Bridgland et al., 2021; Prout et al., 2020). Due to this pattern, the Impact of Events Scale-Revised (IES-R; Weiss & Marmar, 2004) was adapted specifically to the COVID-19 pandemic, now titled Impact of Events Scale-COVID-19 (IES-COVID19) to address the variations in responses during viral outbreaks of pathogens (Vanaken et al., 2020).

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Overall, due to the increased rates of distress during pandemics/outbreaks including a quarantine such as the COVID-19 pandemic, research suggests there is an increased likelihood of poor psychological outcomes.

Individual Impacts of COVID-19. In addition to general impacts, certain individual factors play a key role in how a person reacts to COVID-19 as a stressor. It has been found that a person's emotions connected to their worst COVID-19 pandemic experiences more strongly predicted PTSD symptomatology than other predictor variables, supporting the idea that subjective emotions and distress related to COVID-19 may be a more important factor in psychological outcomes than individual factors (Bridgland et al., 2021). Social roles themselves have been linked as a factor associated with specific outcomes related to the COVID-19 pandemic; students have been shown to be a vulnerable group prone to increased levels of stress, anger, fear, frustration, boredom (Tasso et al., 2021), and loneliness (Horesh et al., 2020; Labrague et al., 2021; Xu et al., 2020). Nurses and healthcare workers, both frontline and non-frontline, are in the same area of vulnerability due to their proximity to COVID-19 (Galanis et al., 2020; Subasi et al., 2021; Li et al., 2020). Outside of social role, factors such as age, gender, loneliness, lack of social support, maladaptive coping skills, and low levels of resilience were also predictors of poor outcome differences related to the COVID-19 pandemic (Labrague et al., 2021). With coping specifically, problem-focused coping was associated with positive outcomes of well-being, whereas emotion-focused coping, such as blaming and somatization, was associated with poorer outcomes (Gotmann & Bechtoldt, 2021; Prout et al., 2020). Additionally, pre-existing health conditions across individuals was important in differentiating psychological outcomes of COVID-19 and quality of life (Horesh et al., 2020).

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Defense mechanisms have also been found to play a role since they are more frequently used during periods of high traumatic stress, like the COVID-19 pandemic (Di Giuseppe et al., 2020a). By using the Defense Mechanism Rating Scale (DMRS-SR-30; Di Giuseppe et al., 2020b), researchers were able to see how defenses have a variety of effects during periods of stress. For example, relying on altruism during periods of high stress is related to decreases in anxiety, whereas reliance on defenses such as disassociation or disavowal is related to increased anxiety (Di Giuseppe et al., 2020a). Additionally, DiGiuseppe et al. (2020c) delved deeper into the psychological impacts of the first week of lockdown on Italian people during the novel COVID-19 pandemic. They used the Symptom Checklist-90 (SCL-90; Derogatis et al., 1973) to assess psychopathology and somatic symptoms, the Impact of Events Scale-Revised (IES-R; Weiss & Marmar, 2004) for PTSD symptomology, and the Defense Mechanism Rating Scale-Self-Report 30 (DMRS-SR-30; DiGiuseppe et al., 2020b) for defense mechanism use. Using a stepwise linear regression, researchers found that having more positive cases nearby, more days on lockdown, and moving due to COVID-19 were associated with increased symptoms of psychological distress/psychopathology. The likelihood of developing PTSD was dependent on age (i.e. 30-39 and 40-49). Women and those in high exposure areas were more likely to develop PTSD. The less adaptive the defenses deployed, the higher the level of psychological distress, psychopathology symptoms, and PTSD-specific symptoms. The more adaptive the defenses deployed, the lower the level of psychological distress, psychopathology symptoms, and PTSD-specific symptoms (DiGiuseppe et al., 2020c).

Another factor of note is rumination; this factor is positively correlated with emotional suppression and avoidance of distressing information/emotions (Nolen-Hoeksema et al., 2008). When this factor was studied during initial stages of the COVID-19 pandemic with the RRS, or

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Rumination Response Scale (Treynor et al., 2003), researchers found that there was an increase in rumination during the lockdown period of the pandemic (Lopez et al., 2020), showing its salience as a potential individual factor affecting outcomes.

Besides negative predictors, some individual factors did act as protective factors during COVID-19. These include positive social support, use of adaptive coping strategies, high levels of emotional resilience (Labrague et al., 2021; Li et al., 2020), and utilization of mindfulness (Lopez et al., 2020), all of which were connected to better or more stable outcomes. Social support has been found to have two sides: on one hand, lack of perceived social support has been linked to poorer psychological outcomes with the COVID-19 pandemic (Seitz et al., 2021; Xu et al., 2020); on the other hand, higher perceived social support in many situations has been shown to be a consistent protective factor during stressful situations (Applebaum et al., 2014; Ciarleglio et al., 2018; Xu et al., 2020). A key point with social support is the importance of perception. A number of factors may influence perception during a global pandemic including changes in social support due to quarantine, lockdown, or loss of support through pandemic-related effects (such as change in living situation, severe illness, hospitalization, or death of support). Due to the duality of the factor of social support, it is of interest to include it and observe the way it may affect the relationships this paper sets out to explore.

With COVID-19 acting as a global stressor still affecting people on a day-to-day basis, and coping mechanisms and defenses shaping the impact stressors have on outcomes, this research is pertinent to the state of the world. Based on general and individual factors affecting COVID-19 related outcomes, this paper seeks to understand the relationship between coping style, defense mechanisms, and subjective distress related to the COVID-19 pandemic. Factors such as demographic information, level of social support, and presence of rumination will be

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examined to determine if they affect outcomes along with their salience related to traumatic stressors. At the time of this paper, there is a lack of research considering both coping and defenses related to subjective distress regarding COVID-19 using novel instruments designed to assess pandemic-specific constructs. This research seeks to fill the gap.

The Present Study

Several factors impact individuals' responses to stressors. Psychological defenses and coping strategies have both been found to shape adjustment. While they overlap in function, these constructs are theorized to be different in a number of ways. Research on these distinctions, however, is mixed, with some studies finding evidence that the two are different and others suggesting greater overlap. The present study seeks to examine if defense mechanisms and coping strategies account for unique variance in adults' management of a highly stressful situation, the COVID-19 pandemic. Such a finding would support the assertion that these two constructs, while functionally related, are unique. While there are studies using instruments like the COPE-48 (Carver et al., 1989) and the DMRS-SR-30 (DiGuiseppe et al., 2020b), only a limited number of studies have looked at coping and defenses with regression analyses using both measures. Finally, this study seeks to understand how social support may be a moderating variable, which has not yet been used in previous studies with the Brief COPE (Carver, 1997) and the DMRS-SR-30 (DiGuiseppe et al., 2020b) in relation to stress associated with the novel COVID-19 pandemic.

Hypotheses

In addition to examining the unique contributions of defenses and coping strategies, we will assess other variables likely to affect adjustment (e.g., social support; family exposure to COVID-19). We make the following hypotheses:

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1. Adaptive coping, mature psychological defenses, and social support will be associated with better adjustment to COVID-19.
2. Adaptive coping, mature psychological defenses, and social support will be inversely associated with rumination during COVID-19.
3. Those more severely affected by COVID-19 will report more subjective distress related to COVID-19.
4. We predict coping and defenses will be independent constructs affecting level of adjustment to COVID-19 as a stressor.
 - a) Adaptive defenses and problem-focused coping will be inversely related to subjective distress surrounding COVID-19.
 - b) Adaptive defenses and problem-focused coping will be inversely related to rumination during COVID-19.
5. We predict that associations between the psychological impact of COVID-19 and efforts to adapt to stress (i.e., psychological defenses; coping) will be partially mediated by rumination.
6. Perceived social support will moderate relationships between coping/defenses and subjective distress related to COVID-19.
 - a) We anticipate that relationships will be positive, but of a lower magnitude in participants who have high (i.e., above median) social support relative to those who have low (i.e., below median) social support.

Chapter II

Methods

Participants

Total sample size of the study consisted of 1,013 participants recruited through Cloud Research. Of that amount, 695 participants followed all consent requirements, correctly answered at least 90% of the validity items, completed the study questions, and did not consistently answer at the floor or ceiling across measures. We utilized a manual entry response for demographic variables gender and race. These were subsequently coded into groupings. Responses that did not fit the groupings were coded as “Other.” Participants ranged from 18 to 85 years of age ($M = 44.28$, $SD = 16.03$). A total of 35.8% identified as male, 60.2% as female, 1.0% as trans/non-binary/genderfluid, and 3.0% as unreportable. Of our sample, 70.6% identified as White/Caucasian, 14.7% identified as Black/African American, 1.2% identified as Native American/American Indian, 2.3% as Asian, 2.6% as Hispanic/Latino/Spanish, 3.9% as Biracial/Multiracial, and 4.8% as Unreportable. When looking at relationship status, 39.8% identified as married, 5.1% as widowed, 14.4% as divorced, 2.7% as separated, and 38.0% as single. For annual income, 43.0% of our sample make less than \$30,000, 34.1% as \$30,000-\$60,000, 11.9% as \$60,000-\$90,000, 4.8% as \$90,000-\$120,000, and 6.2% as more than \$120,000. Completed education was also examined. Within the sample, 5.2% did not complete high school, 48.3% have a high school diploma/GED, 19.3% have completed a 2-year program/associate’s degree, 18.3% have completed a 4-year program/bachelor’s degree, 7.8% have a master’s degree, and 1.0% have a doctoral degree. Finally, the sample demographics

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included number of children. A total of 56.3% endorsed no children, 18.6% noted having one child, 13.7% had two children, 8.2% had three children, 2.2% had four children, <1.0% had five children, and <1.0% had 6 children. Additional demographic information can be found in Table 1.

Measures

CEFIS-AYA (Kazak et al., 2020). The CEFIS-AYA, or the COVID-19 Exposure and Family Impact Scale for Adolescents/Young Adults, is a novel self-report measure assessing the construct of impact of COVID-19. This scale consists of three parts, but only two were used in the current study: the first part focuses on exposure to COVID-19 and COVID-19 related events as a factor. It utilizes “yes” or “no” responses with fill-in-the-blank spaces for contextual information if answered “yes.” Due to time requirements of the survey and patterns of responses from test batches of participants, the fill-in-the-blank options for these questions was eliminated. The exposure section seeks to assess COVID-19 experiences, access to essentials, disruptions to living conditions, loss of income, family caregiving and activities, and designation as an essential worker. The second part assesses the impact of COVID-19 and COVID-19 related events through a 1 to 4 point Likert scale where 1 is (*made it a lot better*) and 4 is (*made it a lot worse*). Non-applicability is an option for this part of the scale. This section also includes a ten-point scale assessment of distress related to COVID-19. Overall, this section of the scale measures personal well-being, family interactions, and distress. The exposure part of the scale has been found to have an internal reliability of $\alpha = 0.91$, while the impact part of the scale has an internal reliability of $\alpha = 0.95$.

Brief COPE (Carver et al., 1997). The Brief COPE, or the Brief Coping Orientation to Problems Experienced Inventory, is the short form to the original COPE-48 (Carver et al., 1989).

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The Brief COPE is a widely used scale measuring the construct of coping style. The short form consists of 28 self-report items assessing frequency of use of specific coping strategies. These are measured on a Likert scale of 1 to 4, with 1 being (*I never do this*) and 4 being (*I do this very often*). Items are categorized into subscales assessing nine types of coping style: active problem-focused coping, alcohol-drug disengagement, focus on venting of emotions, seeking social support, humor, turning to religion, denial, restraint coping, and acceptance and growth. The subscales this study assessed had overall internal consistency ratings as follows: problem-focused coping was found to have an internal reliability of $a = .84$, emotion-focused coping was found to have an internal reliability rating of $a = .78$, and avoidant coping was found to have an internal reliability rating of $a = .79$.

DMRS-SR-30 (DiGiuseppe et al., 2020b). The DMRS-SR-30, or the 30-item Defense Mechanisms Rating Scale Self-Report, is a relatively novel scale measuring the construct of defense mechanisms. This scale consists of 30 self-report items assessing dealing with difficult emotions over the past week on a Likert scale of 0 to 4, with 0 being (*not at all*) and 4 being (*very often/much*). The items are broken down into subscales of defense categories, including mature, neurotic, immature, depressive, and other immature. The scale assesses defense levels through categorization of items indicative of high adaptive, obsessive, neurotic, minor image distorting, disavowal, major image distorting, and action. The DMRS-SR-30 also gives a weighted, overall defensive functioning score based on the score of all 30 items. Recent psychometric analysis indicates the DMRS-SR-30 has an overall internal consistency of $a = 0.89$, while the current study found the following: healthy mature defenses had an internal consistency rating of $a = .83$, mental inhibition-avoidant with an internal consistency rating of $a = .89$, and immature-depressive defenses with an internal consistency rating of $a = .89$.

RRS (Nolen-Hoeksema & Morrow, 1991). The Rumination Response Scale (RRS) is a widely employed self-report scale assessing the construct of rumination. This scale consists of 22 items rated on a scale ranging from 1 to 4, with 1 being (*almost never*) and 4 being (*almost always*). There are three primary subscales of ruminative thinking: reflection, brooding, and depression-related. The RRS has an overall internal consistency of $a = .92$.

MDSPSS (Zimet et al., 1998). The Multidimensional Scale of Perceived Social Support (MSPSS) is a 12-item scale assessing overall access to social support. While it produces an overall score for social support, items are worded to assess support from three distinct sources: close friend/romantic partner, family, and peers. Items are worded as statements that respondents rate on a 1 (*very strongly disagree*) to 7 (*very strongly agree*) Likert scale. The measure has been used with a wide range of populations (e.g., community adults; college sample; adolescents; chronic illness) and has been translated into several languages (Dambi et al., 2018). Internal consistency estimates for the total score have ranged from good to excellent across several studies (Dahlem et al., 1991; Dambi et al., 2018; Zimet et al., 1990). The current study found that the MDSPSS had an overall internal consistency rating of $a = .95$.

IES-COVID-19 (Vanaken et al., 2020). The IES-COVID19, or the Impact of Events Scale With Modifications for COVID-19, is a novel version of the IES assessing the construct of subjective distress related to the COVID-19 pandemic. It has 15 items rated on a scale of 0 to 4, with 0 being (*not at all*) and 4 being (*often*). There are two primary subscales assessing intrusion and avoidance in relation to the construct of subjective distress. One area of note are the items themselves. We chose to change the use of the word “it” to “COVID-19.” Thus, an item like “I thought about it when I didn’t mean to” became “I thought about COVID-19 when I didn’t mean to.” The IES-COVID19 has an excellent internal consistency in the current study, $a = 0.91$.

Validity Items

Ten validity and attention-check items were included in the study to ensure participant attention and prevent invalid participant responses. These items were multiple choice in nature and asked for simple identification for verification purposes.

Procedure

The study was conducted online. Potential participants learned of the study through a posting on Cloud Research. Eligibility for the study was limited to US Cloud Research users and those at least 18 years of age. Interested individuals clicked the link in Cloud Research, which took them to the Qualtrics survey created for this study. Before beginning the formal study survey, potential participants reviewed an online consent form (see Appendix A) that explained the purpose of the study, eligibility criteria, potential risks and benefits, the methods employed in the study, time expected to complete the study, research participant rights, and compensation requirements. Those who wished to continue with the study clicked on the “Next” button to indicate their consent. At this point, the individual was enrolled in the study as a participant. If they answered “No” to any of the questions in the study confirming US residency, age, etc., they were redirected to an exit message and removed from the study.

To begin, participants answered a number of questions about demographic variables. These included age, gender, race, marital status, estimated annual income, and completed education level. Participants moved into answering the multitude of self-report scales, including the CEFIS-AYA, the Brief COPE, the DMRS-SR-30, the MDPSS, the RRS, and the IES-COVID19. After participation, individuals were given contact information for the research team and thanked for their time and effort.

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Any participants that failed one or multiple validity check items were removed from the data set. Data from these participants was removed as well. Individuals who missed any less than 90% of the total items within the Qualtrics survey were removed completely from the data set. Cloud Research determines compensation which is typically between one and three US dollars. Average completion time for the survey was 18.5 minutes.

Data Analytic Plan

Prior to any data analysis, we reviewed distribution of item responses to make sure that all item responses were in range. We calculated all scale/factors scores for the various measures. We examined distributions to determine if linear statistics were appropriate for analyses. We determined, based on same size and distribution that approximated normality, they were appropriate.

We calculated descriptive statistics and reported these as the first part of the Results section for all demographics and scales.

Hypotheses 1-4 describe main effects that are associative in nature. As such, they were evaluated using correlations. Hypothesis 5 asserts that indexes of both coping and psychological defenses will make independent contributions to various outcomes. We used multiple regressions to test these. Hypothesis 6 was tested with moderation analysis using techniques outlined by Hayes and Preacher (2014) as part of their PROCESS program.

Chapter III

Results

Internal Consistency Estimates

The Multidimensional Scale of Perceived Social Support (MDSPSS) produces an overall score and three subscale scores. Internal consistency for the overall score, as well as all subscale scores, were estimated in the excellent range ($\alpha = .95$).

The Rumination Response Scale (RRS) produces an overall score and three subscale scores. Internal consistency for the overall score, along with three subscale scores, were in the excellent range ($\alpha = .96$).

The Impact of Events Scale-COVID-19 (IES-COVID-19) produces an overall score and two subscale scores. Internal consistency for the overall score was estimated in the excellent range ($\alpha = .91$). Internal consistency for the intrusion and avoidance subscales were estimated in the good range ($\alpha = .87$).

The COVID-19 Exposure and Family Impact Scale (CEFIS) contains a single-item scale assessing distress. Additionally, it produces two scale scores, one for exposure and one for impact. The exposure scale is composed of a series of yes-no items. Internal consistency for this scale was in the excellent range ($\alpha = .91$). Internal consistency for the impact scale, which is composed of items answered on a four-point Likert scale, was estimated in the excellent range ($\alpha = .95$).

The Defense Mechanisms Rating Scale-Self Report-30 (DMRS-SR-30) contains a single item score for each defense, a proportional score by level, and a weighted overall defense

functioning score. As such, internal consistency is not an appropriate way to assess the psychometric adequacy of these scales. However, we calculated three factor scales based on the findings of Prout and colleagues (2022). Internal consistency for the Healthy Mature factor scale was estimated in the good range ($\alpha = .83$). Internal consistency for the Mental Inhibition and Avoidance factor scale was estimated in the good range ($\alpha = .89$). Internal consistency for the Immature-Depressive factor scale was estimated in the good range ($\alpha = .89$).

The Brief Coping Orientation to Problems Experienced (Brief COPE) produces 14 subscales, but each is composed of just two items. Thus, coefficient alpha is not appropriate (given that three items are required for adequate estimation). However, similar to the DMRS-SR-30, subscales can be collapsed into three second-order factor scales (each containing several items). Given that we anticipated employing the factor scales in our analyses, we estimated internal consistency for these scales. Internal consistency for the emotion-focused coping factor scale was estimated in the adequate range ($\alpha = .78$). Internal consistency for the problem-focused coping factor scale was estimated in the good range ($\alpha = .84$). Internal consistency for the avoidance coping factor scale was estimated in the adequate range ($\alpha = .79$).

Descriptive Correlations

Table 3 depicts intercorrelations among all scales. Many of these are provided for descriptive purposes, while others are referenced below as part of our hypothesis tests. Here we briefly note some associations that informed our analyses. First, the IES-COVID-19 scale was significantly associated with the CEFIS Exposure scale ($r = .42, p < .01$) the CEFIS Distress Single Item scale ($r = .38, p < .01$), and the overall RRS score ($r = .50, p < .01$), but it was not significantly associated with the CEFIS Impact scale ($r = .03, p = .39$). Thus, the IES-COVID-19 scale and the CEFIS Impact scale are likely assessing two different types of impact in our

sample. Relative to the IES-COVID-19 measure, the CEFIS Impact scale had lower associations with the CEFIS Exposure scale ($r = .18, p < .01$) and the RRS ($r = .23, p < .01$). It was associated with the CEFIS-Distress Single Item scale ($r = .36, p < .01$) at roughly the same level as the IES-COVID-19 scale. As can be seen in the Appendices containing the two measures, the IES-COVID-19 items are worded to capture more psychological features of impact (e.g., mental distress and avoidance) while the CEFIS Impact scale items are more focused on functional impact (e.g., impact on child rearing; impact on sleeping; impact on substance use). Thus, both appear to assess two different types of impact which are relatively unrelated to one another in our sample. As such, we generally examined associations with both types of impact to test hypotheses regarding the impact of COVID-19.

Hypothesis 1 - COVID-19 Impact and Use of Defenses and Coping Mechanisms

In our first hypothesis, we asserted that the healthy use of psychological defenses and coping strategies would be associated with negative impact from COVID-19. To test this hypothesis, we calculated three sets of correlations. First, we examined correlations between the three DMRS-SR-30 factor scales and the overall score for the IES-COVID-19 (Psychological Impact) and the COVID-19 Impact subscale of the CEFIS (Functional Impact). Second, we correlated the three Brief COPE factor scales with the overall score for the IES-COVID-19 (Psychological Impact) and the COVID-19 Impact subscale of the CEFIS (Functional Impact), respectively. Finally, we correlated the overall score for the MDSPSS with the overall score for the IES-COVID-19 (Psychological Impact) and the COVID-19 Impact subscale of the CEFIS (Functional Impact).

As can be seen in Table 2, the Healthy Mature factor scale of the DMRS-SR-30 was significantly associated with the overall score for the IES-COVID-19 ($r = .46, p < .01$), but was

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not significantly associated with the COVID-19 Impact subscale of the CEFIS ($r = .04, p = .36$). The DMRS-SR-30 Mental Inhibition Avoidance factor scale was associated with the IES-COVID-19 ($r = .58, p < .01$) and the CEFIS Impact subscale ($r = .15, p < .01$). The DMRS-SR-30 Immature-Depressive factor was associated with the IES-COVID-19 ($r = .53, p < .01$), but was not significantly associated with the COVID-19 CEFIS Impact Scale ($r = .07, p = .06$). In general, greater psychological impact (IES-COVID-19) was associated with more frequent use of all levels of psychological defenses.

Table 2 also shows association between COVID-19 distress and use of coping strategies. The Brief COPE Problem-Focused factor scale was associated with the IES-COVID-19 (Psychological Distress) ($r = .35, p < .01$). Because our sample is large, it was also significantly associated with the CEFIS Impact subscale ($r = .09, p = .02$). The Brief COPE Emotion-Focused factor was associated with the IES-COVID-19 ($r = .43, p < .01$), but was not significantly associated with the CEFIS Impact subscale of the CEFIS ($r = .04, p = .28$). The Brief COPE Avoidance Factor was associated with the IES-COVID-19 ($r = .50, p < .01$) and evidenced a statistically significant but smaller association with the CEFIS Impact scale ($r = .15, p < .01$). In short, larger psychological impact from COVID-19 (IES-COVID-19) was associated with an increase in use of all three forms of coping. Functional impacts from COVID-19 (CEFIS Impact) has much smaller associations with the use of coping mechanisms.

Hypothesis 2 - Rumination, Coping, Defenses, and Social Support

Our second hypothesis had two components. In the first, we asserted that rumination during COVID-19 would be associated with less adaptive defenses and less adaptive coping. In the second, we asserted that rumination would be associated with lower levels of perceived social support. To test the first component, we correlated the RRS (rumination) with the Brief

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COPE Avoidance factor, the DMRS-SR-30 Mental Inhibition-Avoidance factor, and the DMRS-SR-30 Immature-Depressive factor. To test the second component, we correlated the RRS (rumination) and the MDPSS scale (perceived social support) respectively.

As shown in Table 2, the RRS was associated with the DMRS-SR-30 Mental Inhibition-Avoidance factor ($r = .74, p < .01$), the DMRS-SR-30 Immature-Depressive factor ($r = .69, p < .01$), and the Brief COPE Avoidance factor ($r = .60, p < .01$). On one hand, these findings are directly in line with our hypothesis. In general, greater rumination was associated with more frequent use of less mature defenses and coping strategies. However, there is reason to view this finding with considerable skepticism. First, the RRS was also positively associated with the DMRS-SR-30 Healthy Mature factor ($r = .45, p < .01$), the Brief COPE Problem-Focused factor ($r = .31, p < .01$), and the Brief COPE Emotion-Focused factor ($r = .52, p < .01$). These scales assess mature defenses and adaptive coping. While not explicit within our hypothesis, we had anticipated these scales would be unrelated and/or inversely related to rumination. Instead, they proved to be positively related (although at a lower magnitude of association). Thus, we must conclude the findings for this component of our hypothesis is mixed given that rumination appeared to increase the frequency of use of all types of defenses and coping strategies more generally. We can mildly assert that rumination appears to correspond relatively more powerfully with the use of less mature defenses than it does with healthy defenses.

With regards to the second component of the hypothesis, the RRS was inversely associated with the overall score for the MDSPP ($r = -.23, p < .01$). This finding was as expected. Those who ruminated more reported perceiving less access to social support.

Hypothesis 3 - Is Exposure and Impact of COVID-19 Relate to Distress?

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In our third hypothesis, we advanced that those greatly impacted by COVID-19 would report higher levels of subjective distress. To test this hypothesis, we correlated the single-item CEFIS Distress scale with the IES-COVID-19, the CEFIS Impact scale, and the CEFIS Exposure scale. As shown in Table 2, the CEFIS-Distress scale was associated with the IES-COVID-19 ($r = .38, p < .01$), the CEFIS COVID-19 Impact scale ($r = .36, p < .01$), and the CEFIS COVID-19 Exposure score ($r = .52, p < .01$). Overall, results supported our hypothesis. Exposure, functional impact, and psychological impact were all positively linked to COVID-19 subjective distress.

To further explore this hypothesis, we examined if rumination, a form of cognitive distress, was associated with COVID-19 impact and exposure. The RRS was associated with the IES-COVID-19 ($r = .50, p < .01$), CEFIS Impact scale ($r = .23, p < .01$), and the CEFIS Exposure scale ($r = .43, p < .01$). This pattern mirrors those obtained with the CEFIS-Distress single item scale, in suggesting that exposure, functional impact, and psychological impact are all linked to subjective distress in response to COVID-19.

Hypothesis 4 - Do Psychological Defenses and Coping Mechanisms Have Unique Relationships with COVID-19 distress?

This was the most important hypothesis within our study. Experts draw distinctions between psychological defenses and coping mechanisms. Conceptually, both are attempts to adapt to stressors. However, both are viewed as distinct in many ways (e.g., conscious vs. unconscious). If these forms of adjustment are truly unique, they should each make unique contributions to the prediction of stress-related responses. Thus, in our fourth hypothesis, we asserted that psychological defense scales and coping mechanism scales would each show unique, non-redundant associations when predicting impact of COVID-19 (Part A) and to overall

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rumination during COVID-19 (Part B). Since the IES-COVID-19 and the CEFIS were found to assess impact differently in our sample, we conducted two different regression analyses in Part A.

To test Part A, we ran two sets of regressions. In the first set, psychological impact, as measured by the IES-COVID-19 scale was the dependent variable. In the first regression (Regression 1), the DMRS-SR-30 factor scales were entered on Step 1 and COPE factor scales were entered at Step 2. The second regression (Regression 2) was identical except that the order of entry was reversed (coping factor scales were placed on Step 1 and defense factor scales were placed on Step 2). As shown in Table 3, multiple Brief COPE factor scales and DMRS-SR-30 factor scales made statistically significant, unique contributions to the prediction of psychological impact (IES-COVID-19).

Because psychological impact and functional impact appeared to be measured differently by the IES-COVID-19 and CEFIS Impact scale, we ran two additional regressions to assess the assertions of Part A of this hypothesis. The dependent variable for these regressions was functional impact (CEFIS Impact scale). For the first regression model in this set (Regression 3), DMRS-SR-30 factor scales were entered at Step 1 and Brief COPE factor scales were entered at Step 2. In the second model (Regression 4), the order of entry was reversed. As can be seen in Table 4, several Brief COPE factor scales and DMRS-SR-30 factor scales made statistically significant, unique contributions to the prediction of COVID-19 impact (CEFIS Impact scale). Overall, both sets of regressions supported the assertion that self-report measures of psychological defenses and coping are non-redundant. Each account for unique variance in the psychological and functional impact of significant stressors.

For Part B of this hypothesis, we also ran a set of regressions. The dependent variable for these regressions was rumination as measured by the RRS. The first model in the set (Regression 5) included the DMRS-SR-30 factor scales at Step 1 and Brief COPE factor scales at Step 2. For the second regression (Regression 6), order of entry was reversed. These regressions are shown in Table 5. The same pattern emerged as described above. Several Brief COPE factor scales and DMRS-SR-30 factor scales made statistically significant, unique contributions to the prediction of variance in rumination.

Hypothesis 5 – Are Associations Between Psychological Impact, Coping, and Defenses Partially Explained by Rumination?

This hypothesis asserted that the association between efforts to adjust to stress and the psychological impact of COVID-19 would be partially explained by rumination. Specifically, we expected that when the psychological impact COVID-19 leads to rumination, it would increase the use of defenses and coping mechanisms. To test this hypothesis, we examined four mediation models using the Hayes PROCESS (v.4.1) macro for SPSS (v28). Specifically, we considered the indirect effects model and the standardized model. The first model focused on overall use of defenses, the second on use of problem-focused coping, the third on use of emotion-focused coping, and the fourth on use of avoidance coping. For each model, we used 5,000 bootstrapped samples and set our confidence interval to 95%. To determine if there was evidence of mediation, we examined upper and lower confidence intervals for indirect effects based on the bootstrapped samples. When a zero did not occur within the interval between the lower limit confidence interval and the upper limit confidence interval, it suggests that the indirect effect for rumination is significant at the $p < .05$ level.

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In the first model, the dependent variable was the DMRS-SR-30 ODF score. The predictor variable was the IES COVID-19. The mediator variable was the RRS score. As can be seen in Figure 1, there was evidence for partial mediation. The completely standardized indirect effect was .15 ($SE = .02$) while the lower level confidence interval was .11 and the upper level confidence interval was .19. Given that a zero was not included within these intervals, this indicates evidence for mediation at a significance level of $p < .05$. As shown in Figure 1, the direct effect for the association between IES-COVID-19 and the DMRS-SR-30 ODF was .58 and it declined notably to .30 when RRS was added to the model. However, this association was still significant and of a small-to-moderate effect size. Thus, while rumination explains a portion of the relationship it is clearly not fully explaining the relationship.

In the second model, the dependent variable was the Brief COPE-PF score, the predictor variable was the IES COVID-19 Scale total score (which indexes distress from COVID-19), and the mediator variable was the RRS score (which assesses rumination). As can be seen in Figure 2, there was some very mild evidence for partial mediation. The completely standardized indirect effect was .09 ($SE = .02$) while the lower level confidence interval was .02 and the upper level confidence interval was .07. Given that a zero was not found within these intervals, this indicates evidence for mediation at a significance level of $p < .05$. However, as can be seen in Figure 2, evidence of even partial mediation is somewhat weak given the size of associations. With the large sample size in our study, the ability to obtain statistical significance is likely a function of the study being overpowered. Specifically, the direct effect for the association between IES-COVID-19 and the COPE-PF was .34 and only mildly declined to .26 when RRS was included in the model. While this decline is statistically significant, the amount of mediation occurring is small. In fact, the association between RRS and the COPE-PF showed a much

larger decline when the IES-COVID-19 was included in the model. Thus, while there is statistically significant evidence for partial mediation the size of this effect is quite small.

In the third model, the dependent variable was the Brief COPE-AV score, the predictor variable was the IES COVID-19, and the mediator variable was the RRS score. As can be seen in Figure 3, there was evidence for partial mediation. The completely standardized indirect effect was .23 ($SE = .02$) while the lower level confidence interval was .19 and the upper level confidence interval was .27. Given that a zero was not found within these intervals, this indicates evidence for mediation at a significance level of $p < .05$. As shown in Figure 3, the direct effect for the association between IES-COVID-19 and the COPE-AV was .50 and it declined notably to .26 when RRS was included in the model. In contrast, the association between RRS and COPE-AV remained moderate-to-large at .47 when the IES-COVID-19 was included in the model. Overall, this pattern of findings suggest that partial mediation is taking place.

In the fourth model, the dependent variable was the Brief COPE-EF score, the predictor variable was the IES COVID-19 and the mediator variable was the RRS score. As can be seen in Figure 4, there was evidence for partial mediation. The completely standardized indirect effect was .20 ($SE = .02$) while the lower level confidence interval was .17 and the upper level confidence interval was .25. Given that a zero was not found within these intervals, this indicates evidence for mediation at a significance level of $p < .05$. As shown in Figure 4, the direct effect for the association between IES-COVID-19 and the COPE-EF was .43 and it declined notably to .23 when RRS was included in the model. In contrast, the association between RRS and COPE-EF remained moderate at .41 when the IES-COVID-19 was included in the model. Overall, this pattern of findings suggest that partial mediation is taking place.

Overall, while we ran four models, each model focused on the same overall hypothesis. Across the four models, the three predicting DMRS-SR-30 ODF, the Brief COPE Avoidance factor scale, and Brief COPE Emotion-Focused factor scale all exhibited evidence of partial mediation. There was also weak evidence for partial mediation in the model predicting Brief COPE Problem-Focused factor scale. Thus, our findings are largely aligned with our original hypothesis. One way by which the psychological impact of COVID-19 leads to increased use of defenses and coping strategies (especially avoidance and emotion-focused coping) is through the activation of rumination.

Hypothesis 6 – Does Perception of Social Support Moderate Associations Between the Psychological Impact of COVID-19 and the use of Defense and Coping Strategies?

Our sixth hypothesis asserted that perceived social support would moderate relationships between coping/defenses and subjective distress related to COVID-19. Specifically, we anticipated that the association would be weaker in individuals with higher levels (i.e., above median) of social support and stronger in individuals with less social support (i.e., below the median). To test this hypothesis, we utilized the Hayes PROCESS (v.4.1) macro for SPSS (v28). We again ran four different models to assess this hypothesis. We also used the standard procedure of employing 5,000 bootstrapped samples and a confidence interval of 95%. In this approach, a significant interaction effect between a moderator and predictor variable indicates evidence for moderation. When this occurs, steps must be taken to delineate the nature of this moderation.

In the first model, the DMRS-SR-30 ODF score was entered as the predictor variable, the IES-COVID-19 was entered as the dependent variable, and the MDPSS score was entered as the moderator variable. The interaction effect was not significant ($\Delta R^2 = .01$, $\Delta F(1, 689) = 1.97$, $p =$

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.16). We then ran three more models, one for each of the Brief COPE factor scales. In all three of these, the dependent variable was the IES-COVID-19 and the moderator variable was the MDPSS score. Similar to the first model, none of the interaction terms were significant (p -values ranging from .25-.78). Thus, we did not find any evidence to support our hypothesis.

Chapter IV

Discussion

The first major question this study addresses is theoretical in origin: are psychological defenses and coping mechanisms truly different? Though both are believed to impact adjustment to stressful situations, theorists have made arguments for differentiating defenses from coping. For example, Cramer (2008) and Kramer (2010) assert that coping mechanisms and defense mechanisms have core similarities and differences. While coping mechanisms are more conscious, external, and situational; (Cramer, 1998; Cramer, 2008; Kramer, 2010), defense mechanisms are largely unconscious, dependent on developmental level, internal, and dispositional (Cramer 2008; Kramer, 2010). Both are activated by perceived stressors and have a similar goal of reducing distress in the body and brain (Cramer, 1998; Cramer, 2008; Kramer, 2010; Lazarus & Folkman, 1984).

Many of the studies that have effectively differentiated defenses from coping mechanisms have used radically different measurement approaches for psychological defenses and coping strategies. For example, Cramer (2008) measures defenses indirectly through expert-ratings of narratives gathered from picture-story tasks, but measures coping strategies via self-report. Recently, there is increasing use of self-report measures to assess psychological defenses. This has led some researchers to question, separate from theory, if defenses and coping strategies are different at the level of measurement when self-report measures are employed. Specifically, regardless of theory, do self-report measures of defenses and coping mechanisms actually assess

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different things? Our findings support the assertion that even when self-report measures of defenses and coping strategies are used, there remains evidence that they are different.

Through linear regression analyses, we were able to illustrate that defenses and coping mechanisms uniquely account for variance in a notable stressor: COVID-19. If the variables were the same, or at least similar enough to have little differentiation, we would expect them to provide redundant information. Specifically we would have expected that the category entered into Step 2 of the model to make no significant, incremental contribution of variance beyond the first. Instead, what our results show is that as degree of impact went up, so too did deployment of defenses and coping strategies. When functional impact, as measured with the CEFIS, was the dependent variable, a similar pattern emerged in that both coping and defenses proved to be unique predictors. These findings align with some prior studies. For example, Vally et al. (2020) found that engagement in problematic internet was best predicted by including measures of both coping and defenses. Coping mechanisms and psychological defenses have also been shown to account for unique variance in parental attachment style in breast cancer patients (Renzi et al., 2017) and development of psychopathology during COVID-19 (Prout et al., 2020). Our study not only extends prior research examining the utility of assessing both coping and defenses, it extends it by applying this approach to the study of a highly ecologically valid stressor, a global pandemic. The theoretical implication being that while there is clearly some overlap between the concept of coping mechanisms and psychological defenses, the constructs are sufficiently distinct to merit separate measures. A practical implication is that those studying adaptation to stress would do well to assess both categories of response.

The second big question our study addresses was: does COVID-19 distress and impact increase utilization of coping and defense mechanisms? Overall, we found that the more

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functionally and psychologically impacted by COVID-19 a person was, the more they employed coping and defenses. People who were not as distressed by COVID-19 reported using coping and defenses less frequently. This aligns with the theoretical literature on the subject. For example, Lazarus and Folkman (1984) and Cramer (1998; 2008) assert that the experience of stress cues the person to deploy both coping mechanisms and unconscious defense mechanisms. Cramer's (2008) Pillar IV: Stress argues that as exposure to stress increases, frequency of defense deployment increases, especially for less adaptive defenses. Cramer (2008) argues that stress activates biological systems (e.g., the HPA axis) that produce stress hormones in the blood and raise blood pressure, heart rate, and skin conductance, which then unconsciously activates psychological defenses in an effort to adapt to the situation. Indeed, a recent study of acute stress responses with time series analyses of the parasympathetic nervous system and the sympathetic nervous system found that activity in these systems is linked to a defensive cascade (Nackley & Friedman, 2021). Thus, those more impacted by an acute stressor exhibit more defenses. While we did not measure physiological indicators, we found the same pattern in our study using an ecologically valid stressor, the COVID-19 pandemic. Our study also found that being more impacted by a stressor resulted in more frequent use of all types of defenses, especially less mature defenses (i.e., Mental Inhibition-Avoidance; Immature-Depressive).

Additionally, it's the perception of stress, or threat, that can trigger these biological responses and subsequent deployment of psychological mechanisms like coping and defenses meant to protect the individual. Using Lazarus and Folkman's (1984) model of threat appraisal, we asserted that COVID-19 can be theoretically seen as a global stressor. Combining this with the severity of impact from quarantine such as fear of infection, frustration, boredom, lack of necessary supplies, absence of personal space/meaningful social interactions, and inadequate

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information (Bridgeland et al., 2021; Brooks et al., 2020), it follows that those who perceive themselves as more impacted would be utilizing more coping (and defenses) to manage their daily lives.

The literature overwhelmingly supports the assertion that COVID-19 is a distressing event (Bridgeland et al., 2021, Brooks et al., 2020, Prout et al., 2020), where the emotional connection to specific COVID-19 experiences may be a large predictor of psychological distress (Bridgeland et al., 2021). Thus, if COVID-19 is clearly a notable stressor, and if stressors are associated with increased use of defenses and coping mechanisms, then those more impacted (i.e., stressed) by COVID-19 should report more frequent use of coping strategies and defenses. It is of no surprise that such a pervasive stressor would cause higher levels of distress and increase reliance on the adaptive skills people have at hand to manage it. Our results suggest that the experience of psychological impact, functional impact, or both, triggers efforts to adapt, cope, and defend.

Another way our results support the study of coping and defenses simultaneously is through the pathway of rumination. Rumination is a response to distress where the individual repeatedly focuses on symptoms, causes, and consequences of the stressful event (Nolen-Hoeksema et al., 2008). Part of our research involved mediation analyses with rumination, coping, defenses, and COVID-19 impact. If coping and defenses were the same mechanisms, we would expect rumination to account for the roughly same level of change when explaining how distress and coping/defenses are related. Instead, we found that rumination explains distinct levels of variance between existing relationships of distress and coping/defenses. Specific levels of coping and defenses will be discussed later in this section. All forms of coping/defenses were activated with COVID-19 psychological impact and worry, suggesting that the introduction of

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rumination explained distinct levels of variance between the existing relationship of distress and coping/defenses. Therefore, when people are more distressed by COVID-19, they engage in higher levels of worry (rumination), which results in them deploying more coping and defense mechanisms. As people become less distressed by COVID-19, they do not engage in the same pattern of worry, and thus rely less on coping and defenses.

One reason rumination may help explain how psychological impact and efforts to adapt affect each other comes from the biological impact of rumination. Zocola and Dickerson (2012) examined studies that measured rumination and cortisol. They found that the more a person ruminates, or worries, the more activated the HPA axis, which is responsible for our built-in stress management system in the form of regulating adrenal stress hormones, and the more at risk they may be for health issues (Zocola & Dickerson, 2012). Based on this research and our results, we believe increases in distress/impact of COVID-19 leads to individuals engaging in more rumination. The compounding stress from COVID-19 and persistent worry increases the release of stress hormones in the blood, which then triggers deployment of coping and defense mechanisms to try and return to baseline/decrease distress. Coping and defenses have been similarly linked to acute stress leading to increased immune and endocrine responses (Olf et al., 1995). Those in the control group of Olf (1995) did not use the same level of coping and defenses to regulate their immune and endocrine systems. Individual differences in coping and defenses were further found to regulate immune and endocrine responses (Olf et al., 1995) and change the way someone may appraise a stressor, thus modulating the biological systems associated with stress responses (Olf et al., 2005). To our knowledge, this phenomenon has not yet been studied and/or published in current literature surrounding COVID-19. One possible avenue of intervention in this pattern would be through the utilization of mindfulness.

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Mindfulness has been found to be a protective factor during the COVID-19 pandemic (Lopez et al., 2020). Based on our ideas, mindfulness may be a particularly useful intervention for helping people self-regulate their biological and psychological stress-management systems when feeling intense worry.

One interesting thing to note is that this set of analyses revealed strong direct effects between COVID-19 distress and coping/defense mechanism use. What this means is that rumination was only partially able to explain the relationship between COVID-19 distress and coping/defenses. This is neither a positive nor a negative thing; all it means is rumination is one avenue (of many) explaining this relationship. At this time, it is impossible to explain what other mechanisms may link COVID-19 impact and efforts to cope and defend. This is an opportunity for future research in the study of COVID-19.

Something we found in our results that we did not set out to find is a difference in the way we were measuring impact. As stated in our results section, we ended up defining impact in two different ways: psychological and functional. Psychological impact involved more rumination, psychological distress, and negative thinking as a function of COVID-19, while functional impact involved the different concrete ways lives can be impacted by COVID-19 (e.g., greater difficulty with work; greater difficulty with daily tasks). Functional impact may cause distress, but it is not inherently distressing. For example, our index of functional impact produced smaller associations with rumination compared to our index of psychological impact. We strove to make this distinction after discovering these categories. To our knowledge, no published study has used or compared the IES-COVID19 scale and CEFIS in the context of the COVID-19 pandemic. Since both scales are looking at effects within a person's everyday life, we expected the scales to have fairly high agreement with each other and associations with other

variables within the study. This was due to prior studies using the IES-COVID-19 or the CEFIS (Kazak et al., 2020; Vanaken et al., 2020). What we found instead is that psychological impact appears somewhat unique from functional impact. Patterns of associations between the two forms of impact and other variables in this study sometimes overlap (e.g., both had similar associations with subjective distress from impact) and were sometimes quite different (e.g., psychological impact was much more associated with exposure than was functional impact).

This appears to be in line with current COVID-19 literature. Exposure is heavily linked to psychological impact and distress (Bridgland et al., 2021; Brooks et al., 2020; Lopez et al., 2020; Prout et al., 2020). Proximity to COVID-19 (i.e. exposure) has been shown to affect functional impact in groups like university students (Schiff et al., 2021), frontline and non-frontline healthcare workers (Galanis et al., 2020; Li et al., 2020; Subasi et al., 2021), and specific cultural communities (Rogers et al., 2021). Practically speaking, providers working with people in mental health settings should independently assess functional impact and psychological impact. Similarly, researchers studying COVID-19 may wish to consider both functional impact and psychological impact to study the effects of COVID-19. This may help inform treatment approaches and recommendations.

We also found that the addition of rumination supports the separation of the two factors (i.e. psychological impact and functional impact). Both functional and psychological impact increased risk for rumination/worry. People who were more psychologically and functionally impacted by COVID-19 engaged in more rumination/worry. People who were less psychologically and functionally impacted by COVID-19 engaged in less rumination/worry. While there is little to no research on functional impact of COVID-19 and rumination at the time of this study, literature on rumination and distress during COVID-19 has been published. Kang

and Kim (2021) sought to study how rumination and social support might predict distress during COVID-19. They used a hierarchical regression model to do so. Results support the idea that presence of rumination aggravates COVID-19 distress (Kang & Kim, 2021). It has also been shown to increase with both exposure and psychological distress during COVID-19 (Lopez et al., 2020).

Practically speaking, this is a possible avenue for treatment of individuals affected by the COVID-19 pandemic who may be struggling with severe worry and elevated distress. Presence of ruminative tendencies is correlated with a number of disorders like depression, substance use, anxiety/worry, and eating disorders such as bulimia (Nolen-Hoeksema et al., 2008). It is an adaptive pattern of thought that routinely provides relief from intense distress (Nolen-Hoeksema et al., 2008), so providers use the presence of rumination as an indicator of distress. Strategies that reduce rumination (e.g., mindfulness; building self-efficacy) may serve to reduce at least some of the negative outcomes associated with being more psychologically and functionally impacted by COVID-19.

There was an interesting pattern of relationships with distress, impact, and social support. We assumed social support to be a protective factor based on prior literature both pre-pandemic and during it (Applebaum et al., 2014; Ciarleglio et al., 2018; Seitz et al., 2021; Xu et al., 2020). When people perceive an absence or lack of social support, this can have detrimental effects (Seitz et al., 2021; Xu et al., 2020). Our results show that between psychological impact and functional impact, only functional impact had significant inverted associations. The more perceived social support a person had, the less severe their functional impact. The less perceived social support a person had, the more severe their functional impact. This does support prior literature during COVID-19 (Xu et al., 2020) but extends it through the differentiation between

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psychological impact versus functional impact. What may have caused this? We believe it may be due to the nature of functional impact in that individuals may become more aware of social support systems in their lives due to said impact, thus increasing reliance on these systems. Specifically, social support may be experienced as more useful for practical problems in functioning. Concretely, individuals may view access to social supports as particularly useful for things like picking up children from activities/school, household chores, and getting groceries. Conversely, psychological impacts are more internalized. Individuals may not view access to social supports as useful for managing rumination, intrusive thoughts, worries, and preoccupations around COVID-19. Additionally, they may feel this distress is their own to handle (instead of relying on social support).

Another question we sought to answer was in patterns of specific coping and defense styles. Prior literature has used a variety of methods and measures to assess these factors. Our study extends literature on coping and defenses with the use of a hierarchical regression method and by using two specific measures. To our knowledge, no study has used the Brief COPE (Carver, 1997) or the DMRS-SR-30 (Di Giuseppe et al., 2020b) together. The following results may be beneficial in opening future areas of research along with validating the use of these measures when considering coping and defenses. Additionally, the insight gained through the results of this study may assist in the development of COVID specific interventions for mental health professionals.

The literature states that the category of defenses is important when considering how the defense may be affecting psychological outcomes or overall adjustment to a stressor (Cramer, 1991a; Cramer, 2008; Cramer, 2015; Digiuseppe et al., 2020a; Digiuseppe et al., 2020c). In general, people who relied more on mature psychological defenses (i.e., Healthy Mature)

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experienced a decreased amount of psychological impact, while use of immature psychological defenses (i.e., Mental Inhibition-Avoidance and Immature-Depressive) increased psychological impact, putting people at higher risk for negative psychological outcomes (Cramer, 1991a; Nickel & Egle, 2006). Within coping, use of Problem-Focused coping is more predictive of positive adjustment in the face of a stressor (Lazarus & Folkman, 1984; Prout et al., 2020; Vally et al., 2020). Emotion-Focused coping and Avoidance coping are positively associated with poorer psychological outcomes (Lazarus & Folkman, 1984; Nolen-Hoeksema et al., 2008; Vally et al., 2020). Using regressions, it has been shown that both adaptive and non-adaptive forms of coping and defenses are predictive of differences in an outcome like problematic internet usage (Vally et al., 2020). During COVID-19, it has also been shown that people who rely on the emotion-focused coping strategy of somatization and immature defenses predicted the development of depression, anxiety, or posttraumatic stress symptoms (Prout et al., 2020).

Using regressions, we found that the more people utilized Mental Inhibition-Avoidance defenses and, to a lesser extent, Healthy Mature defenses, along with Avoidance coping and Problem Focused coping (the latter to a smaller degree), the more psychologically impacted the person was. Once these defenses and coping strategies were accounted for, the role of Immature-Depressive defenses and Emotion-Focused coping dropped out. This means that people who used more Avoidant coping and Mental Inhibition-Avoidance defenses (i.e., people who were turning away from and denying the impact of stress) are more likely to report greater psychological impact. People who used less Avoidant coping and Mental-Inhibition-Avoidance defenses are less likely to experience greater psychological impact.

Similar patterns emerged for functional impact. This was more likely to occur when people failed to use Problem-Focused coping, failed to use Immature-Depressive defenses, used

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more Avoidant coping, and more Mental Inhibition-Avoidance defense strategies. In this way, avoidance and denial, respectively, led to a failure to engage in effective problem-solving coping or emotional suppression, thus increasing the risk for functional problems. People who were able to successfully problem-solve and/or emotionally suppress (i.e., Immature-Depressive defenses) their reaction were able to decrease their use of avoidance and denial, which further decreased their risk for functional problems.

How people cope and defend has been found to affect impact from a stressor (Olf et al., 1995). Avoidance specifically was a consistent theme in our results. People appear to be more willing to turn away from COVID-19 as a stressor, which seems to increase the risk for psychological impact and functional impact. There is an overall failure to engage in emotional processing mechanisms (i.e., Emotion-Focused coping). This form of experiential avoidance is highly informative. Experiential avoidance is an overall reluctance to experience negative feelings, thoughts, memories, and bodily feelings associated with specific memories (Hayes et al., 1996). Experiential avoidance has been linked to mediating the relationship between fear of COVID-19 and psychological adjustment to COVID-19 (Secer et al., 2022). Thus, people were unable to process their intense emotional experiences with COVID-19 and their meanings on a person's life, perhaps due to the pain of their distress. Using Lazarus and Folkman's (1984) framework, experiential avoidance can be seen as a failure to face and reappraise a stressor, thus increasing risk for psychological and/or functional impact. COVID-19 as a stressor may be limiting a person's coping self-efficacy (Chesney et al., 2006) through the threat appraisal of COVID-19. We believe this impact is what we are seeing in our results. COVID-19 as a stressor may lead to a decreased belief in one's ability to cope. Personal experiences from COVID-19 are

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then avoided/denied. That avoidance/denial seems to increase psychological vulnerability to psychological impact.

With COVID-19 affecting so many aspects of life (financial, occupational, familial, etc.), it is no wonder a failure to engage in problem-focused coping specifically led to increased risk for functional impact. Problem-focused coping is more likely to be engaged in when the stressor is within a person's sense of control (Lazarus & Folkman, 1984). Continuing with Lazarus and Folkman's (1984) model of threat appraisal, problem-focused coping is more adaptive because it changes the way one perceives the threat/stressor, thus decreasing activation of the sympathetic nervous system that regulates fight vs. flight responses. This phenomenon has also been studied through biological mechanisms like immune and endocrine responses (Olf et al., 1995; Olf et al., 2005). When people were unable to engage in this adaptive pattern of coping, we saw increased reliance on avoidance and denial which then increased overall risk for functional impact. Lack of perceived control over functional areas of one's life (ability to care for one's well-being, transportation, accessibility to needed resources, etc.) is closely linked with just how impactful these functional areas are with adjustment to stressors.

It's been shown during the COVID-19 pandemic that the more worry a person engages in, the more likely they were to engage in avoidant behaviors (Taylor et al., 2020), and comparatively, the more Emotion-Focused coping strategies a person used, the more likely they were to worry and/or develop anxiety (Prout et al., 2020). Our mediation analyses suggested that the psychological impact of COVID-19 might promote more frequent use of defenses in general and use of avoidance focused coping. Others have also linked rumination to less adaptive forms of coping, such as emotion-focused and avoidance coping (Nolen-Hoeksema et al., 2008; Stroebe et al., 2007). Cramer's (2008) Pillar IV of defenses suggests that the more distress a

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person feels, the more likely they are to rely on defense mechanisms. Our results also fit with this assertion. The more rumination a person reported, the more they used defenses. In fact, within our regression model predicting rumination, we found that the two least adaptive defense levels (Mental Inhibition-Avoidance; Immature-Depressive) and the two least adaptive coping strategies (Emotion-Focused; Avoidance) were the best predictors of rumination. Thus, our results support the idea that the more a person worries about COVID-19, the more likely they are to employ less adaptive strategies to manage their stress.

Finally, we sought to understand how social support may moderate the relationship between coping/defenses and subjective distress. We failed to find evidence to support the presence of moderation with social support. We were unable to identify possible moderating relationships, suggesting social support itself may affect coping/defense use and subjective distress to COVID-19 in ways that exist beyond the scope of this paper.

Limitations

Our findings should be considered within the context of the study limitations. One major limitation is that the study did not use time series data or analyses to understand how coping, defenses, distress, and impact have ebbed and flowed over the course of the pandemic. Given our cross-sectional approach, our regressions must be interpreted in a correlational manner. Additionally, this study did not look at patterns of coping and defenses prior to the beginning of the COVID-19 pandemic, thus there was no way to assess for change. This study was also retrospective in nature, which may have affected the data we collected. Since data collection was conducted in May/June of 2022, it is considered past the height of severity of the COVID-19 pandemic, which also may have affected the data we collected. Our choice of self-report measures could also have affected data in that people are not the most reliable or accurate in

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reporting on themselves. It is possible they could have over or under-reported their distress or impact, along with coping/defense patterns.

Another limitation is in the choice of measures. We chose to utilize the IES-COVID-19, the CEFIS, and the DMRS-SR-30. All of these are relatively new tools of measurement that have not been widely studied.

Future Research

Future research into this area should take into consideration a number of different avenues of exploration. Utilization of other analyses should be prioritized when researching the theoretical and practical differences with coping and defenses. Factor analysis and longitudinal analysis in particular would be beneficial in understanding how COVID-19 specifically as a stressor supports or challenges the theoretical basis upon which this study is based. The more diversity in analyses, the more support present for the development of tools and measures for practical and research application in the field.

An obvious area of future consideration would be in analysis of main effects between COVID-19 distress, overall defensiveness, and the multiple factors of coping. Since rumination was only a partial mediator, there are other things going on in that relationship that may be salient to understanding the effects of COVID-19 distress. Additionally, a factor analysis of the IES-COVID-19 and CEFIS Impact would be beneficial in understanding what factors the two are tapping into and how they may be related and unrelated to each other.

Conclusion

The purpose of this study was to find support for the theoretical basis of differentiating coping and defenses as unique factors activated through the perception of stress during the COVID-19 pandemic. Through this, we were able to study patterns of adaptation to COVID-19

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stress. We found support for coping and defenses existing as two unique factors that are jointly active by stress. COVID-19 as a stressor overall increased efforts to cope and defend. It also revealed that people engage in higher levels of rumination, or worry, during COVID-19.

Additionally, we found that there are differences in how impact is measured with COVID-19, as both psychological impact and functional impact were relevant in stress outcomes. Specific patterns of coping and defenses exist in relation to psychological impact, functional impact, and rumination, further supporting the continued study of coping and defenses in conjunction with each other. Excessive worry was also found to partially mediate the relationships between psychological impact and overall defensiveness, emotion-focused coping, and avoidant coping. This supports the study's aim in distinguishing coping and defenses, as if coping and defenses were the same, we would not see each factor accounting for statistically significant, unique amounts of variance across the board. Overall, this study extends prior research and opens the avenue for further research as the world continues to adapt to the ongoing COVID-19 pandemic.

Tables

Table 1: Demographic Information of the Sample

Variable	<i>N</i>
Age	692
Gender	693
Male	248
Female	417
Trans/Non-binary/Genderfluid	7
Unreportable	21
Race	693
White	489
Black/African-American	102
Native American/American Indian	8
Asian	16
Hispanic/Latino/Spanish	18
Biracial/Multiracial	27
Unreportable	33
Relationship Status	693
Married	276
Widowed	35

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Divorced	100
Separated	19
Never Married	263
Annual Income	690
Less than \$30,000	297
\$30,000-\$60,000	235
\$60,000-\$90,000	82
\$90,000-\$120,000	33
More than \$120,000	43
Education	
Did not complete high school	36
High school diploma/GED	335
Two-year program/Associates degree	134
Four-year program/Bachelor's degree	127
Master's degree	54
Doctoral degree	7
Number of Children	
0	379
1	125
2	92
3	55
4	15
5	6

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Table 2: Descriptive Statistics and Intercorrelations Among Study Scales

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. IES COVID-19	15.97	10.61	-											
2. CEFIS Exposure	9.76	6.95	.42**	-										
3. CEFIS Impact	2.87	0.65	.03	.18**	-									
4. CEFIS Distress	6.00	2.67	.38**	.52**	.36**	-								
5. MDSPSS Sum	57.43	17.13	.06	-.09*	-.31**	-.07	-							
6. RRS Sum	49.56	16.45	.50**	.43**	.23**	.48**	-.23**	-						
7. DMRS-SR-30 Mature	16.18	6.59	.46**	.37**	.04	.38**	.18**	.46**	-					
8. DMRS-SR-30 MIA	15.97	9.34	.58**	.43**	.15**	.46**	-.10**	.74**	.63**	-				
9. DMRS-SR-30 ID	28.43	18.64	.53**	.38**	.07	.37**	-.09*	.69**	.55**	.83**	-			
10. COPE-PF	18.77	5.56	.35**	.33**	-.09*	.31**	.24**	.31**	.63**	.36**	.32*	-		
11. COPE-EF	26.29	6.72	.43**	.41**	.04	.40**	.17**	.52**	.64**	.55**	.53**	.74**	-	
12. COPE-AV	15.61	5.12	.50**	.44**	.15**	.44**	.14**	.60**	.43**	.65**	.64**	.40**	.61**	-

Note: All correlations demarcated with a * are significant at the $p < 0.05$ level, while those demarcated with a ** are significant at the $p < 0.01$.

IES COVID-19 Sum = Impact of Events Scale sum; CEFIS Exposure = COVID-19 Exposure and Family Impact Scale, Exposure subscale; CEFIS

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Impact = COVID-19 Exposure and Family Impact Scale, Impact subscale; CEFIS Distress = COVID-19 Exposure and Family Impact Scale, Single-Item Distress subscale; MDSPSS Sum = Multidimensional Scale of Perceived Social Support sum; RRS Sum = Rumination Response Scale sum; DMRS-HM = Defense Mechanisms Rating Scale-SR-30 Healthy-Mature factor scale; DMRS-MIA = Defense Mechanisms Rating Scale-SR-30 Mental Inhibition and Avoidance factor scale; DMRS-ID = Defense Mechanism Rating Scale-SR-30 Immature-Depressive factor scale; COPE-PF = Coping Orientation to Problems Experienced-Short Form Problem-Focused factor scale; COPE-EF = Coping Orientation to Problems Experienced-Short Form Emotion-Focused factor scale; COPE-AV = Coping Orientation to Problems Experienced-Short Form Avoidant

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Table 3. Regressions Using Defenses and Coping to Predict COVID-19 Psych. Impact

Regression 1

Step	<i>R</i>	<i>R</i> ²	<i>F</i>	ΔR^2	ΔF	Variable	β	<i>t</i>
Step 1	.60	.35	126.16**	-	-			
						DMRS-HM	.15	3.88**
						DMRS-MIA	.36	6.18**
						DMRS-ID	.15	2.67**
Step 2	.62	.38	69.74**	.03	9.02**			
						DMRS-HM	.10	2.05*
						DMRS-MIA	.31	5.14**
						DMRS-ID	.09	1.62
						COPE-PF	.10	2.05*
						COPE-EF	-.03	0.57
						COPE-AV	.18	3.99**

Regression 2

Step	<i>R</i>	<i>R</i> ²	<i>F</i>	ΔR^2	ΔF	Variable	β	<i>t</i>
Step 1	.53	.28	88.50**	-	-			
						COPE-PF	.11	2.25*
						COPE-EF	.12	2.06*
						COPE-AV	.38	9.34**
Step 2	.62	.38	69.74**	.03	9.02**			
						COPE-PF	.10	2.05*
						COPE-EF	-.03	0.57
						COPE-AV	.18	3.99**
						DMRS-HM	.10	2.05*
						DMRS-MIA	.31	5.14**
						DMRS-ID	.09	1.62

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Note. ** = $p < .01$; * = $p < .05$; DMRS-HM = Defense Mechanisms Rating Scale-SR-30 Healthy-Mature factor scale; DMRS-MIA = Defense Mechanisms Rating Scale-SR-30 Mental Inhibition and Avoidance factor scale; DMRS-ID = Defense Mechanism Rating Scale-SR-30 Immature-Depressive factor scale; COPE-PF = Coping Orientation to Problems Experienced-Short Form Problem-Focused factor scale; COPE-EF = Coping Orientation to Problems Experienced-Short Form Emotion-Focused factor scale; COPE-AV = Coping Orientation to Problems Experienced-Short Form Avoidant

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Table 4. Regressions Using Defenses and Coping to Predict COVID-19 Functional Impact

Regression 3

Step	<i>R</i>	<i>R</i> ²	<i>F</i>	ΔR^2	ΔF	Variable	β	<i>t</i>
Step 1	.81	.03	7.76**	-	-			
						DMRS-HM	-.08	1.74
						DMRS-MIA	.32	4.44**
						DMRS-ID	-.14	2.15*
Step 2	.27	.07	8.82**	.04	9.59**			
						DMRS-HM	.05	0.83
						DMRS-MIA	.22	3.04**
						DMRS-ID	-.21	3.12**
						COPE-PF	-.27	4.49**
						COPE-EF	.10	1.52
						COPE-AV	.17	3.03**

Regression 4

Step	<i>R</i>	<i>R</i> ²	<i>F</i>	ΔR^2	ΔF	Variable	β	<i>t</i>
Step 1	.23	.53	12.76**	-	-			
						COPE-PF	-.25	4.40**
						COPE-EF	.12	1.82
						COPE-AV	.18	3.73**
Step 2	.27	.07	8.82**	.02	4.68**			
						COPE-PF	-.27	4.49**
						COPE-EF	.10	0.13
						COPE-AV	.18	3.03**
						DMRS-HM	.05	0.83
						DMRS-MIA	.22	3.04**
						DMRS-ID	-.21	3.12**

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Note. ** = $p < .01$; * = $p < .05$; DMRS-HM = Defense Mechanisms Rating Scale-SR-30 Healthy-Mature factor scale; DMRS-MIA = Defense Mechanisms Rating Scale-SR-30 Mental Inhibition and Avoidance factor scale; DMRS-ID = Defense Mechanism Rating Scale-SR-30 Immature-Depressive factor scale; COPE-PF = Coping Orientation to Problems Experienced-Short Form Problem-Focused factor scale; COPE-EF = Coping Orientation to Problems Experienced-Short Form Emotion-Focused factor scale; COPE-AV = Coping Orientation to Problems Experienced-Short Form Avoidant

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Table 5. Regressions Using Defenses and Coping to Predict Rumination during the Pandemic

Regression 5

Step	<i>R</i>	<i>R</i> ²	<i>F</i>	ΔR^2	ΔF	Variable	β	<i>t</i>
Step 1	.75	.57	301.49**	-	-			
						DMRS-HM	-.02	0.56
						DMRS-MIA	.55	11.46**
						DMRS-ID	.25	5.58**
Step 2	.77	.60	167.63**	.03	15.17**			
						DMRS-HM	-.07	1.78
						DMRS-MIA	.48	10.03**
						DMRS-ID	.18	3.96**
						COPE-PF	.06	1.46
						COPE-EF	.18	4.14**
						COPE-AV	.11	3.12**

Regression 6

Dependent Variable: Overall score for the RRS

Step	<i>R</i>	<i>R</i> ²	<i>F</i>	ΔR^2	ΔF	Variable	β	<i>t</i>
Step 1	.64	.41	157.13**	-	-			
						COPE-PF	-.13	2.85**
						COPE-EF	.36	6.94**
						COPE-AV	.43	11.63*
Step 2	.77	.60	167.63**	.19	106.17**			
						COPE-PF	-.06	1.46
						COPE-EF	.18	4.14**
						COPE-AV	.11	3.12**
						DMRS-HM	-.07	1.78
						DMRS-MIA	.48	10.03**
						DMRS-ID	.18	3.96**

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Note. ** = $p < .01$; * = $p < .05$; DMRS-HM = Defense Mechanisms Rating Scale-SR-30 Healthy-Mature factor scale; DMRS-MIA = Defense Mechanisms Rating Scale-SR-30 Mental Inhibition and Avoidance factor scale; DMRS-ID = Defense Mechanism Rating Scale-SR-30 Immature-Depressive factor scale; COPE-PF = Coping Orientation to Problems Experienced-Short Form Problem-Focused factor scale; COPE-EF = Coping Orientation to Problems Experienced-Short Form Emotion-Focused factor scale; COPE-AV = Coping Orientation to Problems Experienced-Short Form Avoidant

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Table 6. Fisher r-to-z Comparisons with High and Low Social Support

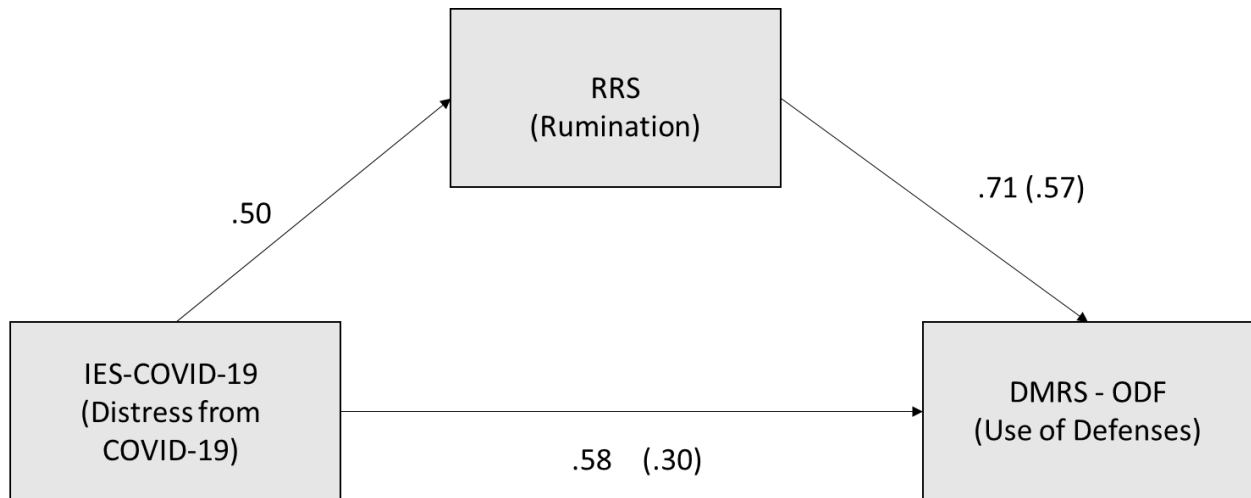
Scale	Low Social Support		High Social Support		<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
DMRS-HM	15.12	6.33	17.04	6.67	3.86	691	0.26	-0.30
DMRS-MIA	17.26	9.08	14.93	9.42	3.30	691	0.35	0.25
DMRS-ID	30.42	17.41	26.81	19.45	2.54	691	0.19	0.19
COPE-PF	17.59	5.10	19.74	5.73	5.15	691	0.01**	-0.39
COPE-EF	25.32	6.07	27.08	7.12	3.45	691	0.00**	-0.26
COPE-AV	16.45	5.24	14.93	4.93	3.94	691	0.04*	0.30
RRS	53.46	16.30	46.41	15.90	5.73	691	0.93	0.44
CEFIS-Exposure	10.24	7.02	9.43	6.86	1.52	691	0.48	0.12
CEFIS-Impact	3.05	0.60	2.73	0.66	6.61	691	0.03*	0.51
CEFIS-Distress	6.21	2.73	5.83	2.61	1.86	691	0.27	0.14
IES-COVID19	15.80	10.30	16.11	10.86	0.38	691	0.76	-0.03

Note. ** = $p < .01$; * = $p < .05$; DMRS-HM = Defense Mechanisms Rating Scale-SR-30 Healthy-Mature factor scale; DMRS-MIA = Defense Mechanisms Rating Scale-SR-30 Mental Inhibition and Avoidance factor scale; DMRS-ID = Defense Mechanism Rating Scale-SR-30 Immature-Depressive factor scale; COPE-PF = Coping Orientation to Problems Experienced-Short Form Problem-Focused factor scale; COPE-EF = Coping Orientation to Problems Experienced-Short Form Emotion-Focused factor scale; COPE-AV = Coping Orientation to Problems Experienced-Short Form Avoidant; RRS = Rumination Response Scale-Overall; CEFIS-Exposure = COVID-19 Exposure and Family Impact Scales-Exposure; CEFIS-Impact = COVID-19 Exposure and Family Impact Scales-Impact; CEFIS-Distress = COVID-19 Exposure and Family Impact Scales-Item 50; and IES-COVID19 = Impact of Events Scale Adapted for COVID-19 Overall

Figures

Figure 1.

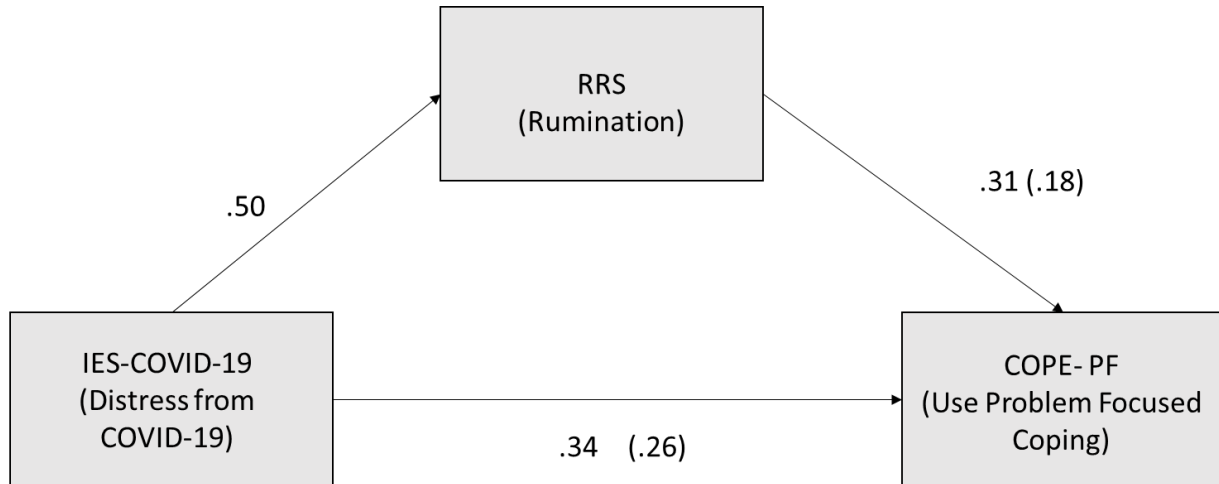
Direct and Indirect Effects for COVID-19 Distress and Rumination on Overall Defensive Functioning



Note. Direct effects in the form of standardized beta (β) are presented outside of parentheses. The numbers in parentheses are standardized beta (β) estimates when the predictor and mediator are both included in the model. All standardized beta (β) estimates statistically significant at $p < .01$.

Figure 2.

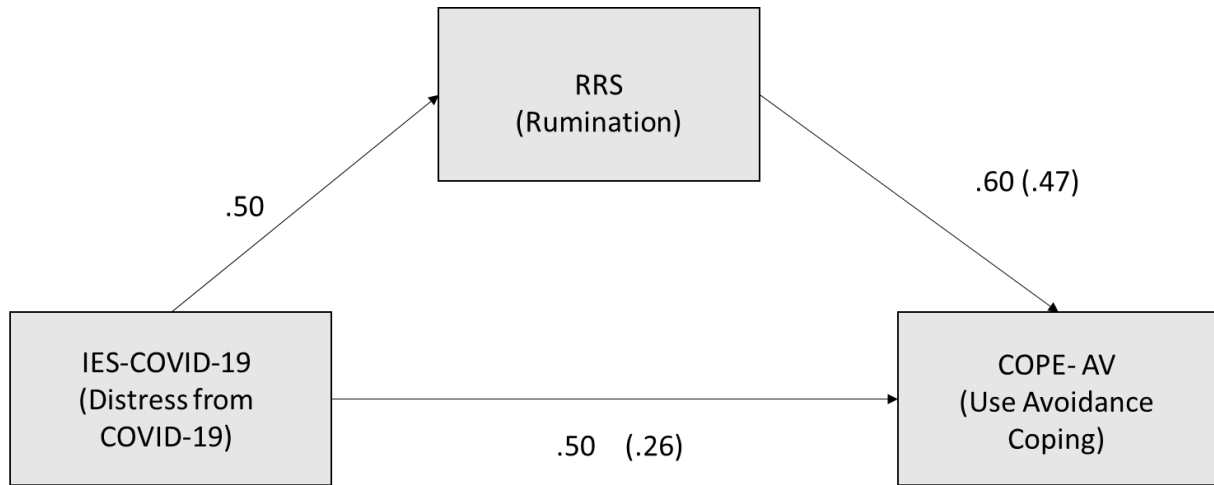
Direct and Indirect Effects for COVID-19 Distress and Rumination on Problem-Focused Coping



Note. Direct effects in the form of standardized beta (β) are presented outside of parentheses. The numbers in parentheses are standardized beta (β) estimates when the predictor and mediator are both included in the model. All standardized beta (β) estimates statistically significant at $p < .01$.

Figure 3.

Direct and Indirect Effects for COVID-19 Distress and Rumination on Avoidant Coping

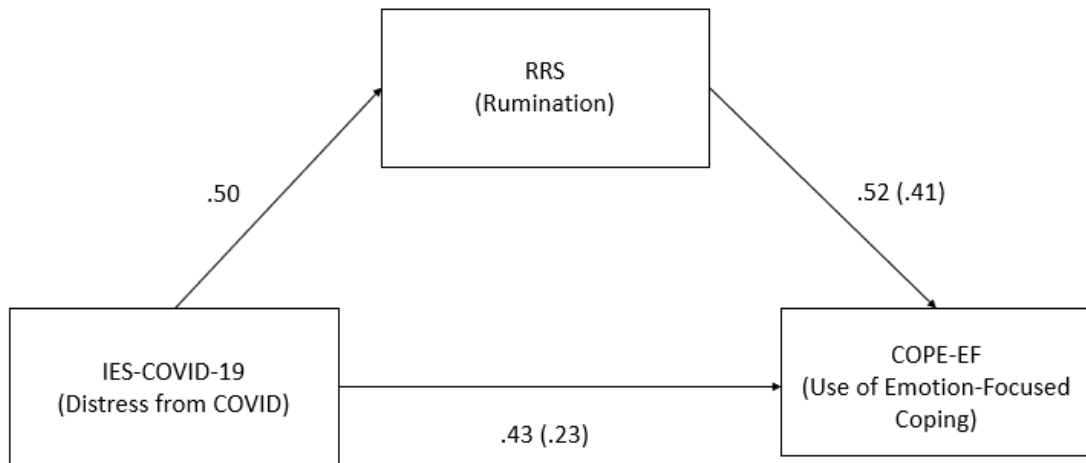


Note. Direct effects in the form of standardized beta (β) are presented outside of parentheses. The numbers in parentheses are standardized beta (β) estimates when the predictor and mediator are both included in the model. All standardized beta (β) estimates statistically significant at $p < .01$.

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Figure 4.

Direct and Indirect Effects for COVID-19 Distress and Rumination on Emotion-Focused Coping



Note. Direct effects in the form of standardized beta (β) are presented outside of parentheses. The numbers in parentheses are standardized beta (β) estimates when the predictor and mediator are both included in the model. All standardized beta (β) estimates statistically significant at $p < .01$.

Appendix

A. Informed Consent

You are invited to participate in a study assessing how coping style and defense mechanisms may affect distress related to the COVID-19 pandemic. It also covers how level of social support and rumination possibly affect this relationship. Taking part in this research project is voluntary.

To participate, you must be at least 18-years-old. You must reside in the United States and be able to read English. Participation involves answering questionnaires on coping style, defense mechanisms, social support, rumination, distress related to COVID-19, and how COVID-19 has impacted you. You will also be asked to provide demographic information (e.g., age; ethnic identity) at the beginning of the study. This study will take approximately 18 to 25 minutes. All responses will be kept confidential.

Benefits of the Research: Although you may not directly benefit from being in this study, others may benefit due to the increased knowledge researchers may gain from your data, particularly regarding the impacts of the COVID-19 pandemic. You may also find the experience of participating in this research to be interesting.

Possible Discomforts: There are few anticipated risks for this study. Researchers have taken steps to minimize any risks, but you may still experience some related to participation. These may include possible feelings of frustration while completing the study and/or a sense that the self-report measures are boring or intrusive. It is important to remember all of your answers are completely anonymous. If a question is too intrusive, you may elect to not answer the question.

Compensation: As a part of your participation, you agree to serve as a research subject for this study. Pending approval by the researchers, compensation is provided through Prime Panels. Upon completion of the study, if you meet the compensation criteria, you will receive compensation in the amount you have agreed to with the platform through which you entered this survey

To be eligible for compensation: You must be 1) 18 years of age or older and must be in the United States, 2) answer 90% or more of the questions, 3) correctly answer 90% of the validity items, and 4) pass a response consistency check.

Withdrawal: You may withdraw at any time from this study without penalty; however, you will not be compensated if you choose to withdraw. The data from those who withdraw will not be used in the final data analysis. Participation in this study is completely voluntary. If you decide to participate now but change your mind, you may stop at any time. You may choose not to

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answer any question in the survey for any reason. *Participants who withdraw early will have their data deleted and/or destroyed and will not be used in any way within the study.*

Confidentiality: As the researchers, we will protect the confidentiality of your research records by storing the data you provide in a private survey, of which only we have access to. At the end of this project, we will keep your data and may use it for future analysis. We plan to publish or present the research completed in this study, but will not include identifying information of you as the participant.

People other than the researchers may need to see the information you provide in this survey.

This is due to our responsibility as an organization to be accountable for our research and ensure it is done safely and properly, such as through the Dearborn IRB. If you have any questions about this research, or would like to learn the findings of this study, you may contact ekatt@umich.edu or csiefert@umich.edu.

As part of their review, the University of Michigan Institutional Review Board has determined that this study is no more than minimal risk and exempt from on-going IRB oversight. This text will be removed if the IRB determines that this study involves more than minimal risk and/or indicates that this study is not exempt from on-going IRB oversight.

Please select from the options below if you consent to be a participant in this study.

B. CEFIS-AYA (Kazak et al., 2020)

Please tell us about your family's experiences during the novel Coronavirus (COVID-19) pandemic. In answering these questions, please think about what has happened from March 2020 to the present, due to COVID-19. By family we mean people you are close with who live in your household, family members who live outside your home, and close friends who you consider "like family."

Part 1. Please answer Yes or No for each of the following statements.

1. I had a "stay at home" order Yes No
2. My school physically closed Yes No NA
3. My education was disrupted (e.g., put on hold, moved to virtual learning) Yes No NA
4. I was unable to visit or care for a family member Yes No
5. I had to start caring for a family member Yes No
6. People in our family lived separately for health, safety, or job demands Yes No
7. Someone moved into our home Yes No
8. I had to move Yes No
9. Someone in the family kept working outside the home (essential personnel) Yes No
-If "Yes", who (e.g., me, my sibling, my child, my spouse/partner, my parent, etc)

10. Someone in the family/household is a healthcare provider/first responder providing direct care Yes No
If "Yes", who (e.g., me, my sibling, my child, my spouse/partner, my parent, etc)

11. I/we had difficulty getting food Yes No
12. I/we had difficulty getting medicine Yes No
13. I/we had difficulty getting health care when we needed it Yes No
14. I/we had difficulty getting other essentials (e.g., cleaning supplies, masks, etc) Yes No (if Yes, specify) _____
15. I/we self-quarantined due to travel or possible exposure Yes No
16. My/our income decreased Yes No
17. I had to cut back hours at work Yes No NA
A member of the family had to cut back hours at work Yes No NA
If "Yes", who (e.g., my sibling, my child, my spouse/partner, my parent, etc)

18. I was required to stop working (expect to be called back) Yes No NA
A member of the family was required to stop working (expect to be called back) Yes No

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If “Yes”, who (e.g., my sibling, my child, my spouse/partner, my parent, etc)

19. I lost my job permanently Yes No NA

A member of the family lost their job permanently Yes No

If “Yes”, who (e.g., my sibling, my spouse/partner, my parent, etc)

20. I lost health insurance/benefits Yes No NA

A member of the family lost their health insurance/benefits Yes No

If “Yes”, who (e.g., my sibling, my spouse/partner, my parent, etc)

21. I missed an important milestone event that was canceled or postponed (e.g., my graduation, my prom, my wedding) Yes No

22. I missed an important family event or it was canceled (e.g., birth, funeral, travel [including vacation]) Yes No

23. Someone in the family was exposed to someone with COVID-19 Yes No

If “Yes”, who (e.g., me, my sibling, my child, my spouse/partner, my parent, etc)

24. Someone in the family had symptoms or was diagnosed with COVID-19 Yes No

If “Yes”, who (e.g., me, my sibling, my child, my spouse/partner, my parent, etc)

25. Someone in the family tried to get tested for COVID-19, but couldn’t Yes No

If “Yes”, who (e.g., me, my sibling, my child, my spouse/partner, my parent, etc)

26. Someone in the family was hospitalized for COVID-19 Yes No

If “Yes”, who (e.g., me, my sibling, my child, my spouse/partner, my parent, etc)

27. Someone in the family was in the Intensive Care Unit (ICU) for COVID-19 Yes No

If “Yes”, who (e.g., me, my sibling, my child, my spouse/partner, my parent, etc)

28. Someone in the family died from COVID-19 Yes No

If “Yes”, who (e.g., my sibling, my child, my spouse/partner, my parent, etc)

Part 2.

COVID-19 may have many impacts on you and your family life. In general, how has the COVID-19 pandemic affected each of the following? Answer on a scale of 1 to 4 with 1 being “Made it a lot better”, 2 being “Made it a little better”, 3 being “Made it a little worse”, and 4 being “Made it a lot worse.” If not applicable to you, please check the empty box.

29. Parenting your children 1 2 3 4

30. How family/household members get along 1 2 3 4

31. Ability to care for your health 1 2 3 4

32. Ability to be independent 1 2 3 4

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33. Ability to care for others in your family 1 2 3 4
34. Your physical wellbeing – sedentary behavior (lack of movement--screen time, sitting, laying down) 1 2 3 4
35. Your physical wellbeing – exercise/ physical activity 1 2 3 4
36. Your physical wellbeing – eating 1 2 3 4
37. Your physical wellbeing – sleeping 1 2 3 4
38. Your physical wellbeing – substance use (smoking/vaping, drinking alcohol, marijuana use, etc) 1 2 3 4
39. Your emotional wellbeing – anxiety/ worry 1 2 3 4
40. Your emotional wellbeing – mood 1 2 3 4
41. Your emotional wellbeing – loneliness 1 2 3 4
42. Your social well-being – relationships with friends 1 2 3 4
43. Your social well-being – romantic relationships or dating 1 2 3 4
44. Please rate the following item on a scale of 1 to 10, with 1 being “No distress” and 10 being “Extreme distress.” Overall, how much distress have you experienced related to COVID-19?
1 2 3 4 5 6 7 8 9 10

Part 3.

Please tell us about other effects of COVID-19 on you and your family, both negative and/or positive.

C. IES-COVID19 (Vanaken et al., 2020)

Please find below a list of statements regarding the situation related to the corona virus (COVID-19). Read each statement carefully and indicate to what extent it was applicable to you during the last seven days. If it did not occur, you can choose 0, which corresponds to ‘not at all’.

Statement	Not at all (0)	Seldom (1)	Sometimes (2)	Often (3)
1. I thought about it when I didn't mean to.				
2. I avoided letting myself get upset when I thought about it or was reminded of it.				
3. I tried to remove it from my thoughts.				
4. I had trouble falling asleep or staying asleep because of pictures and thoughts about it that came into my mind.				
5. I had waves of strong feelings about it.				
6. I had dreams about it.				
7. I stayed away from things that made me think about it.				
8. I felt as if it hadn't happened or wasn't real.				
9. I tried not to talk about it.				
10. Pictures about it popped into my mind.				
11. Other things kept making me think about it.				
12. I was aware that I had a lot of feelings about it, but I didn't deal with them.				
13. I tried not to think about it.				
14. Every thought about it brought back the feelings about it.				
15. My feelings about it were kind of numb				

D. DMRS-SR-30 (DiGiuseppe et al., 2020b)

In the past week, how much did you deal with difficult emotions or situations in the following ways?

Rating scale: (0) Not at all; (1) Rarely/slightly; (2) Sometimes/somewhat; (3) Often/a lot; and (4) Very often/much

1. Did you perceive others as “all good” or “all bad”? 0 1 2 3 4
2. Did you react as if you were detached from personally relevant issues? 0 1 2 3 4
3. Did you develop somatic symptoms such as headache, stomach pain, or the loss of ability to do something, in response to emotional situations? 0 1 2 3 4
4. Did you offer physical or psychological help to others in need? 0 1 2 3 4
5. Did you have repetitive or serial daydreams to which you retreated in lieu of real life? 0 1 2 3 4
6. Did you think about how much you would handle difficulties that you might expect in the future? 0 1 2 3 4
7. Did you feel as if there was nothing positive or redeeming about yourself? 0 1 2 3 4
8. Did you have an attitude of giving much more than you received without perceiving the imbalance? 0 1 2 3 4
9. Did you ask for physical or emotional support while doing your best to handle the problem? 0 1 2 3 4
10. Did you try to diffuse the tension by engaging in creative activities? 0 1 2 3 4
11. Did you have an attitude of suspiciousness or perceive others as untrustworthy, unfaithful, or manipulative? 0 1 2 3 4
12. Did you make humorous comments about challenging personal issues or stressful situations? 0 1 2 3 4
13. Did you reflect upon your emotional experiences and personal thoughts? 0 1 2 3 4

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14. Did you try to take your anger out on yourself or express it with self-harming behaviors? 0
1 2 3 4

15. Did you justify or give plausible explanations to cover up the real reasons for personal problems or stressful situations? 0 1 2 3 4

16. Did you take an active role in solving problems that arose? 0 1 2 3 4

17. Did you idealize yourself or others for your/their personal characteristics? 0 1 2 3 4

18. Did you consciously or unconsciously try to irritate someone in indirect or annoying ways? 0 1 2 3 4

19. Did you temporarily put aside your personal needs to deal with other things that needed to be done? 0 1 2 3 4

20. Did you focus on minor or unrelated matters that distracted you away from a problem that makes you anxious? 0 1 2 3 4

21. Did you discuss an emotional topic in general or impersonal way, without considering or experiencing your feelings? 0 1 2 3 4

22. Did you complain about how others don't understand you or don't usually care? 0 1 2 3 4

23. Did you experience strong feelings toward someone, thinking that the other person intended to make you feel that way? 0 1 2 3 4

24. Did you feel confused, "spaced out", or unable to talk about a distressing topic? 0 1 2 3 4

25. Did you engage in verbal or physical fights? 0 1 2 3 4

26. Did you have trouble remembering simple things? 0 1 2 3 4

27. Did you avoid thinking about personal problems or feelings? 0 1 2 3 4

28. Did you perceive yourself a very strong, powerful, untouchable? 0 1 2 3 4

29. Did you have contradictory or conflictual ideas about a topic that made you anxious? 0 1 2 3 4

30. Did you devalue yourself or others for your/their personal characteristics? 0 1 2 3 4

E. Brief COPE (Carver, 1997)

These items deal with ways you've been coping with the stress in your life since you found out you were going to have to have this operation. There are many ways to try to deal with problems. These items ask what you've been doing to cope with this one. Obviously, different people deal with things in different ways, but I'm interested in how you've tried to deal with it. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. How much or how frequently. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Use these response choices. Try to rate each item separately in your mind from the others. Make your answers as true FOR YOU as you can.

1 = I haven't been doing this at all

2 = I've been doing this a little bit

3 = I've been doing this a medium amount

4 = I've been doing this a lot

1. I've been turning to work or other activities to take my mind off things.
2. I've been concentrating my efforts on doing something about the situation I'm in.
3. I've been saying to myself "this isn't real."
4. I've been using alcohol or other drugs to make myself feel better.
5. I've been getting emotional support from others.
6. I've been giving up trying to deal with it.
7. I've been taking action to try to make the situation better.
8. I've been refusing to believe that it has happened.
9. I've been saying things to let my unpleasant feelings escape.
10. I've been getting help and advice from other people.
11. I've been using alcohol or other drugs to help me get through it.
12. I've been trying to see it in a different light, to make it seem more positive.
13. I've been criticizing myself.
14. I've been trying to come up with a strategy about what to do.
15. I've been getting comfort and understanding from someone.
16. I've been giving up the attempt to cope.
17. I've been looking for something good in what is happening.
18. I've been making jokes about it.
19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.
20. I've been accepting the reality of the fact that it has happened.
21. I've been expressing my negative feelings.
22. I've been trying to find comfort in my religion or spiritual beliefs.
23. I've been trying to get advice or help from other people about what to do.
24. I've been learning to live with it.

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25. I've been thinking hard about what steps to take.
26. I've been blaming myself for things that happened.
27. I've been praying or meditating.
28. I've been making fun of the situation.

F. RRS (Nolen-Hoeksema et al., 2008)

People think and do many different things when they feel depressed. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you feel down, sad, or depressed. **Please indicate what you generally do, not what you think you should do.** Please rate each statement on scale of 1 through 4, where 1 is “Almost never”, 2 is “Sometimes”, 3 is “Often”, and 4 is “Almost always”.

1. Think about how alone you feel. 1 2 3 4
2. Think “I won’t be able to do my job if I don’t snap out of this.” 1 2 3 4
3. Think about your feelings of fatigue and achiness. 1 2 3 4
4. Think about how hard it is to concentrate . 1 2 3 4
5. Think “What am I doing to deserve this?” 1 2 3 4
6. Think about how passive and unmotivated you feel. 1 2 3 4
7. Analyze recent events to try to understand why you are depressed. 1 2 3 4
8. Think about how you don’t seem to feel anything anymore. 1 2 3 4
9. Think “Why can’t I get going?” 1 2 3 4
10. Think “Why do I always react this way?” 1 2 3 4
11. Go away by yourself and think about why you feel this way. 1 2 3 4
12. Write down what you are thinking about and analyze it. 1 2 3 4
13. Think about a recent situation, wishing it had gone better . 1 2 3 4
14. Think “I won’t be able to concentrate if I keep feeling this way.” 1 2 3 4
15. Think “Why do I have problems other people don’t have?” 1 2 3 4
16. Think “Why can’t I handle things better?” 1 2 3 4
17. Think about how sad you feel. 1 2 3 4
18. Think about all your shortcomings, failings, faults, mistakes. 1 2 3 4
19. Think about how you don’t feel up to doing anything . 1 2 3 4
20. Analyze your personality to try to understand why you are depressed. 1 2 3 4
21. Go someplace alone to think about your feelings. 1 2 3 4
22. Think about how angry you are with yourself. 1 2 3 4

G. MDPSS (Zimet et al., 1988)

Instructions: We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Circle the “1” if you Very Strongly Disagree

Circle the “2” if you Strongly Disagree

Circle the “3” if you Mildly Disagree

Circle the “4” if you are Neutral

Circle the “5” if you Mildly Agree

Circle the “6” if you Strongly Agree

Circle the “7” if you Very Strongly Agree

1. There is a special person who is around when I am in need. 1 2 3 4 5 6 7
2. There is a special person with whom I can share my joys and sorrows. 1 2 3 4 5 6 7
3. My family really tries to help me. 1 2 3 4 5 6 7
4. I get the emotional help and support I need from my family. 1 2 3 4 5 6 7
5. I have a special person who is a real source of comfort to me. 1 2 3 4 5 6 7
6. My friends really try to help me. 1 2 3 4 5 6 7
7. I can count on my friends when things go wrong. 1 2 3 4 5 6 7
8. I can talk about my problems with my family. 1 2 3 4 5 6 7
9. I have friends with whom I can share my joys and sorrows. 1 2 3 4 5 6 7
10. There is a special person in my life who cares about my feelings. 1 2 3 4 5 6 7
11. My family is willing to help me make decisions. 1 2 3 4 5 6 7
12. I can talk about my problems with my friends. 1 2 3 4 5 6 7

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