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The space between stress and reaction: A three-way interaction of active coping, psychological stress, and applied mindfulness in the prediction of sustainable resilience

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Abstract

Amid a global pandemic, data was collected to explore the extent to which resilience practices (active coping and applied mindfulness) under varying degrees of stress levels can promote sustainable resilience, defined as the ability to move through challenges in a way that leads to increased positive adaptation to meet present and future challenges. Results did not support the proposed three-way interaction; however, post-hoc analyses indicated that active coping (r = .316) and applied mindfulness (r = .250) were independently predictive of sustained resilience and, when combined, predicted approximately 20 percent (R^2 = .203) of sustained resilience one month later. Furthermore, the results suggest a significant quadratic two-way moderation between mindfulness and sustained resilience at different stress levels suggesting that at high stress levels, moderate levels of mindfulness are most predictive of resilience. Implications for theory, practice, and future research are discussed.

Keywords: *resilience, active coping, applied mindfulness, psychological stress, resilience strategies, coping, stress, COVID-19, pandemic, bounce forward, sustainable resilience, polynomial, quadratic, curvilinear, moderation.*

Chapter I: Introduction and Literature Review

On March 11, 2020, the World Health Organization declared coronavirus disease-2019 (COVID-19) an international pandemic (Cucinotta & Vanelli, 2020). By late April, 316 million people were under stay-at-home orders in the United States to minimize the spread of the virus (Mervosh et al., 2020), and over 20 million people had lost their jobs (U.S. Bureau of Labor Statistics, 2020). Beyond the physical and financial burdens, the pandemic led to profound psychosocial consequences, including interpersonal and occupational strain, with the potential to drastically increase people's rates and intensity of stress (Kujawa et al., 2020).

The Covid-19 lockdown created a unique window to study the coping strategies related to psychological stress and people's ability to adapt to current and future challenges. The COVID-19 pandemic affected all people with fears for their health; people also feared the quarantine orders (shelter in homes for multiple weeks) put in place by local governments. These concerns held great potential to trigger adverse psychological effects, further increasing stress perceptions and symptoms. Experts predicted that the severity of these symptoms would depend on quarantine duration and extent, feelings of loneliness, the fear of getting the virus, (in)adequate information, and stigma (Brooks et al., 2020). No vaccine had yet been identified or produced. The pervasive uncertainty made it difficult to cope in the present and plan for the future, thus generating additional psychosocial stress (Vinkers et al., 2020).

Amid stressful circumstances, there are various ways one may increase their sense of agency; however, this study will narrow the focus. Turning to the resilience research, one of the most consistent findings is that the higher the perceived controllability of a stress situation is, the better individuals cope with these situations (Vinkers et al., 2020). In fact, the mere perception that one is in control, even in the absence of true control, may be helpful, such as in reducing the

subjective perception of pain or stress (Bowers, 1968; Mackie et al., 1991) and reducing activation in the pain network (anterior cingulate cortex; associated with distress and conflict monitoring).

This study aims to test the hypothesis that when people use active coping strategies (exerting control over their stressful situation) alongside applied mindfulness practices (mind-body awareness to let go of worry), they will be more resilient and perceive themselves as better equipped to face future challenges. This relationship will be especially powerful under high stress. This study presents a unique opportunity to consider the variable stress levels occurring during the first few months of the pandemic. The U.S. was experiencing political unrest and violence, a shaky economy, and a soaring death toll due to COVID-19. Businesses shut down, COVID tests were scarce, and healthcare systems were overburdened. All the while, "stay at home" orders requested non-essential workers to stay at home. There was great fear of the unknown, and for many, there was spare time to consider, "How will I cope through this unprecedented time?"

First, I will discuss the theoretical framing, introducing Bandura's (2006) Social Cognitive theory and, more specifically, his four dimensions of human agency, to explain how different strategies help one build a sense of agency, emotional management, and resilience. Next, I will review four constructs to be investigated in this research: Active Coping, Applied Mindfulness, Psychological Stress, and Sustained Resilience. Finally, I will propose my research hypothesis alongside an integrative research model.

Theoretical Framing: Theory of Human Agency

The overarching theory behind human agency, social cognitive theory, proposes that psychology should adopt an agentic perspective toward human development, adaptation, and

change (Bandura, 1986, 2001). The origins of social cognitive theory suggest a dynamic interplay between a person's environment, the individual's cognition, and behavior. Bandura (1986) proposes that human actions result from the interaction of personal factors, behaviors, and the environment in a triadic feedback relationship, called reciprocal determinism, which affects the choices, efforts, directions, and subsequent actions that people pursue. In other words, the environment influences how a person thinks and feels, which influences their behavior, which impacts the environment, and so on. That said, social cognitive theory rejects a duality between human agency and social structure; it says that the human beings create social systems, and these systems, in turn, organize and influence one's lives.

Bandura (2006) proposes that the human species is unique in its power to shape life circumstances and the course one's life takes. Bandura's (2006) evolved theory of human agency conceptualizes humanity as having agency and capability; that is, humans are not just shaped by their environments and inner forces but *also shape their environment* and can regulate those internal forces. In this conception, people are contributors to their life circumstances, not just products of them.

Bandura further proposes that four core components enable human agency: intentionality, forethought, self-reactiveness, and self-reflectiveness. *Intentionality* is the capacity human beings have to form intentions that include action plans and strategies for realizing them (i.e., active coping). *Forethought* is the capacity for human beings to set goals and anticipate outcomes to motivate themselves. By cognitively visualizing the future, human beings can better consider the present, which motivates behavior. *Self-reactiveness* is the capacity for human beings to self-regulate and choose courses of action in their lives either to motivate themselves and/or to regulate their execution (i.e., people can choose their resilience strategies and emotionally self-

manage). Lastly, *self-reflectiveness* is the self-examination of one's own behavioral and cognitive functioning, the most distinct human core property of agency. In other words, one of the primary capacities that distinguish human beings from other species is their metacognitive capability to reflect upon themselves (i.e., applied mindfulness and the ability to apply learnings forward).

To cultivate sustained resilience, people can draw heavily on the agency dimensions of intentionality and forethought to actively cope. This is valuable, but in high-stress conditions, people may be limited in their ability to maintain this level without also dipping into the agency dimensions of self-reactiveness and self-reflectiveness. Navigating into the latter dimensions allows for practices such as applied mindfulness which is the intentional and non-judgmental attention to the self and present moment. This promotion of self-awareness will enable one to reflect on one's efficacy, the soundness of one's thoughts, emotions, actions, and the meaning of one's pursuits, making corrective adjustments if necessary. Thus, the following sections will review research related to active coping, applied mindfulness, and psychological stress.

Active Coping

Active coping is taking active steps to remove or circumvent the stressor or ameliorate its effects (Carver et al., 1989). It is the extent to which one can regulate one's feelings about an adverse or challenging event and engage in methodological actions to reduce physical or psychological anxiety (Tabibnia & Radecki, 2018), thus drawing on Bandura's agency components of intentionality and forethought. Active coping communicates to the brain that one has agency over the situation and is actively doing something to improve the circumstance. Rather than remaining passive, doing something can help reduce distress (Tabibnia & Radecki, 2018). Active coping does not always mean moving toward the problem or pressing forward but can also present itself as actively avoiding or walking away from threatening environments or

stimuli in favor of other actions and priorities (LeDoux & Gorman, 2001; LeDoux et al., 2017; Tabibnia & Radecki, 2018).

Engaging in active coping can strengthen efficacy and strengthen neural pathways for coping that reduce future stress or negative affect (Tabibnia & Radecki, 2018). However, the key to this is for coping to be *active* rather than *passive (i.e., avoiding)*. For example, if Megan were scolded by her neighbor for not wearing a mask at the bus stop while standing within 6-feet of a boarding passenger, it would be unhelpful for Megan to walk to a different bus route to avoid that neighbor in the future (i.e., passive coping). What would be more helpful is if Megan continued to use the same bus stop, and the next time either wore a mask or stood at a distance from others at the bus stop. This example, although fictitious, examines the distinction between active and passive coping. Active coping is taking the previously unsettling experience that left her feeling emotional or immobilized and starting the process of rewriting a more manageable narrative in her mind. When someone passively avoids a situation, it is counterproductive because the passivity is reinforced, and the person continues to be anxious about the situation. Active coping allows for exercising control, which also strengthens the brain's ability to take control in the future (Tabibnia & Radecki, 2018).

The practice of active coping promotes positive emotions and other positive coping strategies when facing adversity, allowing people to bounce forward in their ability to handle future challenges (Folkman & Moskowitz, 2000, 2004). Examples of active coping strategies include intentionally doing something about one's current situation (e.g., going on a walk around the block before and after work to decompress after a workday), concentrating effort to fix or rid oneself of the problem (e.g., to grocery shopping online to avoid in-person shopping), or identifying what steps need to be taken and taking them one step at a time (e.g., losing one's job

and going online and filing for unemployment; Carver et al., 1997). Active coping strategies are suggested to positively relate to psychological well-being and health (Affleck & Tennen, 1996). Those who can recognize and control their limitations and boundaries are more likely to experience higher levels of resilience during stressful circumstances (Carver et al., 1997; Kobasa, 1979; Ong, et al., 2006; Tabibnia & Radecki, 2018). Active coping is one strategy suggested to increase resilience. However, active coping promotes putting one foot in front of the other, whereas paired with applied mindfulness, one may see an increase in self-awareness and reflection of *how* one's active coping applies to the current state and translates to future challenges.

Applied Mindfulness

Applied mindfulness is the *application* of mind-body promotion or awareness in daily life to let go of thoughts of worry about the future and/or regret from the past (Kabat-Zinn, 2003; Li et al., 2016). It is characteristic of moment-to-moment mental states that emphasize observing and attending to current experiences, including inner experiences, such as thoughts and emotions (Baer et al., 2003; Brown & Ryan, 2003; Germer, 2005), with a nonjudgmental attitude and with acceptance (Bishop et al., 2004). Mindfulness is often considered to have two main components, *awareness,* and *acceptance*. Awareness involves monitoring your experiences, and acceptance refers to monitoring those experiences with an attitude of non-judgmental openness, making no attempt to change or avoid one's thoughts. Implementing both components by being a non-judgmental observer of experience is necessary to derive benefits from mindfulness (Cardaciotto et al., 2008).

Mindfulness interventions are an amalgamation of mind-body practices used to enhance a mode of mindful awareness that fosters present-centered non-judgmental attention to experience

that is free from both cognitive and emotional concerns. In recent years, mindfulness has been adopted as an intervention method to increase awareness of the present moment and help people respond skillfully to mental processes that cause emotional distress and problematic behaviors (Hill & Updegraff, 2012; Jong, 2013; Marlattt & Kristeller, 2000). The major clinical applications of mindfulness are exemplified by Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 2003b), Mindfulness-Based Cognitive Therapy (MBCT; Segal et al., 2002), Dialectical Behavioral Therapy (DBT; Linehan, 1993), and Acceptance and Commitment Therapy (ACT; Hayes, 2004). Although the nature of this study is non-clinical, the history of MBIs is important both clinically and non-clinically and has shaped the interest and research of applied mindfulness (Li et al., 2016).

The process of applying mindfulness in everyday life is known as mindfulness practice. Practice refers to formal and informal techniques and approaches to achieving mindfulness as moments unfold (Kabat-Zinn, 2003). Both the *way* and the *degree* to which a person has engaged in practice (taken together, the process of mindfulness practice) are likely to influence both their level of mindfulness and the benefits of their practice (Chiesa & Serretti, 2009; Chiesa, 2013; Chiesa et al., 2014; Chiesa & Malinowski, 2011; Erisman & Roemer, 2012). Applied mindfulness fosters clarity in any situation by increasing mental awareness. With a heightened sense of connection to oneself, one can tap into more present reality and proactively cope with daily stressors and adversity.

There are three implications regarding applied mindfulness in this study. First, practicing applied mindfulness can enhance multiple of Bandura's (2006) human agency dimensions that active coping does (e.g., strategy, problem-solving, etc.). Second, it can supplement this by enhancing emotional regulation – drawing on Bandura's dimensions of self-reactiveness and

self-reflectiveness. And third, there is some evidence that applied mindfulness can, in turn, impact resilience (Hunter et al., 2018; Tabibnia & Radecki, 2018).

Mindfulness practices can augment the work of active coping by promoting an increase in one's ability to self-regulate one's motivation, goal setting, and proactive behaviors. For example, one can learn to replace faulty thinking and misconceptions with more accurate assessments of an issue or task (Bandura, 1999). Mindfulness may also increase one's capacity to think strategically in planning or goal setting. In other words, there is likely to be an increase in one's ability to (1) consider and integrate the complexities of a given situation and (2) integrate the interests of the future into present decision making (Donaldson-Feilder et al., 2019). Mindfulness practices are also suggested to improve decision-making and problem-solving skills -- core components of active coping (Butler & Grey, 2006).

The increasingly extensive literature on the benefits of mindfulness and meditation interventions offers a range of desirable outcomes, including a decrease in psychological symptoms and emotional reactivity and an increase in subjective well-being and behavioral regulation (Goldberg et al., 2022; Keng et al., 2011), and emotional regulation (Hülsheger et al., 2013). Mindfulness is thought to improve emotional management through increasing one's awareness (Erisman & Roemer, 2010); and, more specifically, an emotional understanding of subtle differences between one's emotional experiences in the present moment.

Emotional awareness is an essential component of effective emotional management (e.g., Gratz & Roemer, 2004; Linehan, 1993). Emotional awareness is defined as "the extent to which people are [cognitively] aware of emotions in both themselves and others" (Ciarrochi et al., 2003, p. 1478). Furthermore, self-reported mindfulness is positively associated with different measures of awareness, such as emotional intelligence – including clarity of emotion and the

ability to label one's emotion (Baer et al., 2003; Brown & Ryan, 2003); it has been negatively related to alexithymia, or a difficulty identifying feelings (Baer et al., 2003). Some researchers believe that affect labeling is helpful as it reduces uncertainty in emotion (Lindquist et al., 2015). This is supported by neural evidence connecting uncertainty to activity in the amygdala. Affect labeling has been shown to activate the lateral prefrontal cortex (helps to override impulse) and down-regulate activity in the amygdala, reducing uncertainty of one's feelings (Lieberman et al., 2007).

When one applies mindfulness toward daily emotions and expressions, one can subtly create distance between one's feelings and thoughts by viewing them as mental states that do not require immediate reaction. This subtle distance between emotions and reactions helps reduce the often-hasty labeling of one's emotional state/s (Hill & Updegraff, 2012). Mindfulness has also recently been associated with less emotional reactivity to external stressors (Arch & Craske, 2010) and repetitive thoughts (Feldman et al., 2010). The reduced reactivity to stressors allows one to think clearly and deliberately engage in resilience practices or behaviors (van den Hurk et al., 2010).

Research suggests mindfulness practices lead to several positive outcomes, including increased cognitive flexibility (Davidson et al., 2000), focus (Moore & Malinowski, 2009), improvement in well-being (Carmody & Baer, 2008), and numerous health benefits, including increased immune functioning (Davidson et al., 2003; Grossman et al., 2004), and reduction in psychological distress (Coffey & Hartman, 2008; Ostafin et al., 2006). Evidence suggests that mindfulness effectively treats stressful or high anxiety situations (Chiesa & Serretti, 2009). Additionally, Donald et al., (2020) suggest that mindfulness is associated with greater interest-taking in everyday activities; for example, in social interactions with romantic partners (Barnes

et al., 2007; Karremans & Papies, 2017; Wachs & Cordova, 2007), engaging in daily work tasks (Shiba et al., 2015), and connecting with natural environments (Wolsko & Lindberg, 2013). Lastly, mindfulness practices are also suggested to reduce stress (Hoffman et al., 2010) and increase resilience (Brown & Ryan, 2003; Brown et al., 2007; Carmody & Baer, 2008; Goldberg et al., 2022; Leary, 2004)

Thus, mindfulness has the potential to enhance and supplement active coping and can increase one's emotional management - primarily through self-awareness, which would likely lead to higher resilience. Active coping and mindfulness are hypothesized to be most important to sustainable resilience practices under conditions of increased psychological stress.

Psychological Stress

Psychological stress is the extent to which persons perceive that their demands exceed their ability to cope, or, to the degree to which situations in one's life are appraised as stressful (Cohen et al. 1983). Research has measured stress in a myriad of ways, including measuring its physiological manifestations, happenings of significant life events (Cobb & Kasl, 1977), the frequency of daily annoyances (Cohen & Weinstein, 1981), and its cognitive appraisal (Cohen, 1983). Stress has also previously been examined from many perspectives, including epidemiological, affective, and psychophysiological perspectives (Epel et al., 2018). Although there are advantages to objective stress measures, different external factors can affect people differently depending on how they cognitively process the events. That is, how one perceives the events can differ.

Thus, Cohen and colleagues (1983) have argued that a person's *cognitive appraisal of stress* is the most critical factor in evaluating stressful events. People interpret environmental events (stressors) based on their values and resources and react differently to them

psychologically, behaviorally, and biologically. Events are characterized as stressful when the burden of the event outweighs a person's perceived available resources (Cohen et al., 1983; Schiffrin & Nelson, 2010).

When humans encounter a potential threat or stressor, the amygdala triggers a temporary physiological autonomic fight-or-flight response that often presents an increased heart rate and inhibition of digestion and metabolism (Staal, 2004). The body is preparing itself to deal with the stressor by allocating all necessary resources. At the same time, the body is releasing the stress hormone cortisol. A prolonged elevation of psychological stress can cause a harmful lasting impact on the brain, including irregular cell growth in the amygdala, as well as neural damage in the hippocampus (affiliated with learning and memory), and the prefrontal cortex (affiliated with planning, personality, decision making, and moderating social behavior; Guidi et al., 2020; Staal, 2004; Roozendaal et al., 2009). Psychological stress, or the perception of feeling overwhelmed, can thereby have adverse mental and emotional effects and even have harmful physical consequences (e.g., weakened immune system, poor sleep, headaches, and gastrointestinal problems; Cohen et al., 1993; McGregor et al., 2008; Guidi et al., 2020; Nixon et al., 2011).

The number of stressors with low controllability introduced by the COVID-19 pandemic was plentiful and sudden (e.g., the COVID-19 virus, stay at home orders, parent’s stress regarding children’s schooling, state of the economy, job security, long-term well-being of the country, governmental response, pending elections, loneliness, financial disruptions, etc.). More specifically, stressful situations characterized by self-evaluative threat and low controllability are prone to increase cortisol levels (Dickerson & Kemeny, 2004; Sonnentag & Frese, 2013). Nearly 8 in 10 adults (78%) said that the coronavirus pandemic was a significant source of stress.

Additionally, 2 in 3 adults (67%) said they had experienced increased stress throughout the early pandemic (American Psychological Association, 2020).

Research suggests that human beings have the power to reverse neural and psychological impairments by reducing stressors (Lupien et al., 2009). Unfortunately, not all stressors can be removed entirely, but the consequences of the stress and people's subsequent resilience can be reduced by various cognitive and behavioral coping strategies (Belise et al., 2017; Diorio et al., 1993; Lupien et al., 2009; Radley et al., 2006; Sonnentag & Frese, 2013).

Resilience

The concept of resilience is central to understanding how people successfully handle adversity, especially in a dynamic and ever-changing environment. Resilience is a complex construct receiving increasing attention in the literature as a general human capacity (Bonanno, 2004; Tedeschi & Calhoun, 2004) and, more specifically, in the work contexts of the individual (e.g., Tabibnia & Radecki, 2018) and organizational (e.g., Fisher et al., 2018) levels. Over the years, many have debated the operationalization of the construct. Meredith et al. (2011) reviewed the broad literature on resilience and noted that prior researchers had offered 104 definitions of the construct. Some people refer to resilience as a *capacity* residing within individuals (Masten & Narayan, 2012), others as an *ability* of individuals to maintain stable functioning in the face of a highly stressful or traumatic event (Bonanno, 2004), and still others as reflecting *growth and positive changes after an adverse event* (Luthans et al., 2006; Maguen et al., 2006).

Furthermore, scholars have considered resilience as a stable personality trait, a state-like developable capacity, or a process (Britt et al., 2016; Kossek & Perrigino, 2016; Richardson, 2002). The *trait* perspective considers resilience a stable personality characteristic or a summation of different personal strengths (Wanberg & Banas, 2000). The *capacity* perspective

sees resilience as a state-like attribute, which, although stable over specific periods, is also flexible over time (Luthans, 2002). Others have characterized it as a process (Fisher et al., 2018; Kossek & Perrigino, 2016; Yost, 2016). The *process* view of resilience aligns with recent theorizing (Fisher et al., 2018; Kossek & Perrigino, 2016) and offers several advantages. Researching resilience from a process framework focuses on the activities individuals can develop and learn regardless of stable traits. Using this framing, people can adopt a combination of actions, malleable capacities, and stable, trait-like elements that can be developed to increase a person's agency and resilience capacity (Yost, 2016).

From a process perspective, resilience outcomes may be influenced by resilience mechanisms and resilience-promoting factors. According to Fisher et al. (2019), *resilience mechanisms* can best be understood as those experiences, reactions, and behaviors that individuals apply during adversity, such as specific coping strategies or emotional responses. An example of a resilience mechanism is actively addressing the problem or planning (i.e., when told to work from home, one converted a guest room into office space). Another example of a resilience mechanism would be emotional management or regulation (i.e., doing a 10-minute meditation in the morning to center oneself; labeling how one feels to promote a sense of connection to self).

Resilience-promoting factors refer to personal or environmental characteristics which are present irrespective of an individual's experience of adversity but can buffer the harmful effects of adversity or foster resilience mechanisms during adverse experiences. Examples of resilience-promoting factors are personality (e.g., conscientiousness), stable and supportive relationships, cognitive ability, socioeconomic advantage, employment opportunities, and internal locus of control. These factors are present irrespective of whether someone experiences adversity. Thus,

the experience of adversity, resilience mechanisms, resilience-promoting factors, and resilience outcomes mark essential elements of the resilience process.

Previous theory and research have included different elements in what characterizes resilience, including merely surviving an adverse experience, returning to previous levels or states, growing from the experience, or increasing one's capacity and confidence to take on future challenges (Britt et al., 2016; Hartmann et al., 2020; Meredith et al., 2011). These elements are considered fundamental to an individual's resilience in this research. If human agency is an essential and adaptive human capacity (Bandura, 2006), then resilience should be operationalized as more than just "getting by." In this way, the process model of resilience is consistent with the definition of Luthans et al. (2007). They define resilience as the ability to move through challenges in a way that leads to increased positive adaptation to meet present and future challenges.

Sustainable Resilience

Most resilience assessments have primarily focused on survival, bouncing back (i.e., recovering from adversity and returning to one's baseline), and sometimes growth (e.g., Smith et al., 2008; Windle et al., 2011). Incorporating a person's perceived ability to take on future challenges is commonly assessed as an individual's general self-efficacy (GSE), the confidence one has in one's ability to complete a future task or goal and one's belief in one's skill level or performance across various situations (Bandura, 1977; Chen et al., 2001; Judge et al., 1998).

GSE has primarily been studied within organizations (Chen et al., 2001; Scholz et al., 2002; Stajkovic & Luthans, 1998). Research indicates that GSE is positively related to favorable organizational and employee outcomes such as job and task performance (Erez & Judge, 2001; Judge & Bono, 2001), job satisfaction, transfer of learning (Blume et al., 2010), goal

achievement, effort, and persistence (Locke & Latham, 2006). Additionally, research suggests other significant outcomes of GSE, including salary increases (Judge & Hurst, 2008) and life satisfaction (Judge et al., 1998), among others (Change et al., 2012). In this way, GSE is part of the resilient mindset because one's confidence, or belief in one's ability, allows people to navigate adversity and challenges and reach desired outcomes.

This comprehensive definition of resilience is associated with many behavioral, psychological, and emotional outcomes such as less burnout (Shoji et al., 2016), lower absenteeism (Avey et al., 2006), greater resistance to stress (Childs & de Wit, 2014; Ong et al., 2006), a greater capacity for growth in challenging times (i.e., an increase in one's ability to make personal changes; Bandura, 1977; Chen et al., 2001), and an overall increased physical health and sense of well-being (Ho et al., 2015; Tugade, & Fredrickson, 2004).

Like historical debates about resilience, there is an academic debate about whether general self-efficacy is a relatively stable personality trait, situation-dependent, or whether it can be developed as a relatively stable attribute ("trait-like"). Several researchers (e.g., Gardner & Pierce, 1998; Judge et al., 1997) have suggested that self-efficacy is a motivational state and *general* self-efficacy is a general motivational trait. Other researchers (Scherbaum et al., 2006; Sheldon, 1990; Wanberg et al., 2020) argue that GSE is state-like and spans many contexts. I will endorse the latter, as there is evidence that GSE can be developed (Eden & Aviram, 1993; Gist & Mitchell, 1992).

Thus, based on the above discussion, resilience includes a combination of previous operationalizations (e.g., resilience as defined by bouncing back and growing) with the confidence to take on future challenges (GSE).

Integrated Research Model

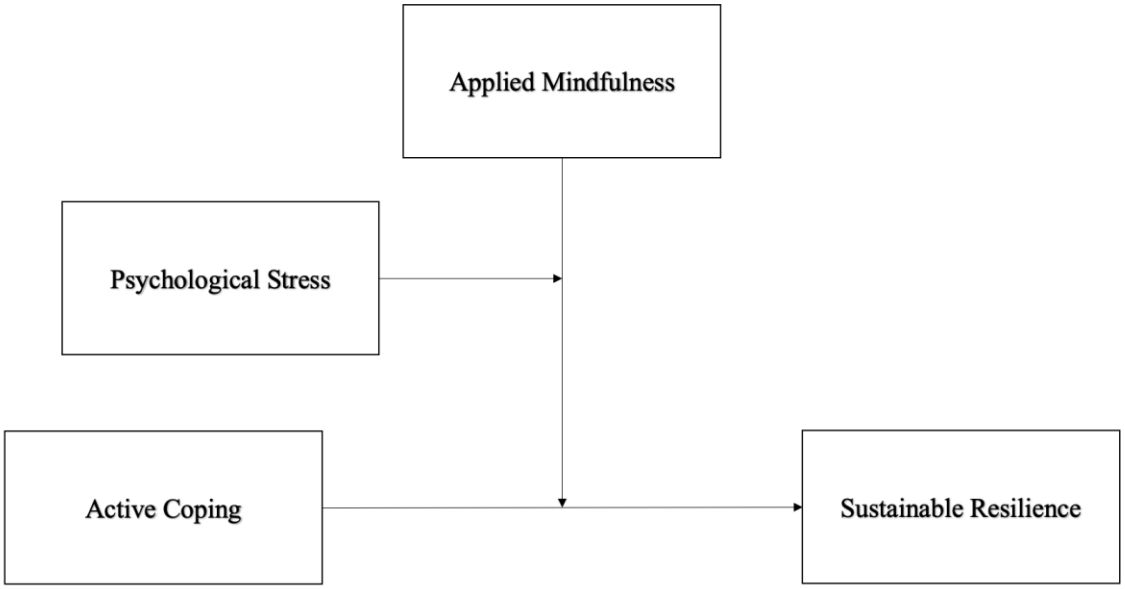
Taking these elements together, it is hypothesized that there will be a three-way interaction between active coping, psychological stress, and applied mindfulness in predicting sustainable resilience (see Figure 1). The three-way interaction under low stress is hypothesized to have a compensatory effect (i.e., at low stress, people will perceive relatively higher sustained resilience regardless of their active coping or applied mindfulness levels; Cohen et al., 2003; Trautwein et al., 2015). Under high stress, it is hypothesized to have a synergistic interaction. In other words, applied mindfulness and active coping will exponentially improve sustainable resilience outcomes (i.e., higher levels of active coping and applied mindfulness will have even more levels of sustainable resilience).

Hypothesis 1. *There will be a three-way interaction between active coping, psychological stress, and applied mindfulness in predicting sustainable resilience one month later.*

To illustrate more specifically what is likely to happen within each condition, the following discussion interprets the hypothesized interactions and predicted sustained resilience levels for people experiencing low stress and high-stress conditions.

Figure 1

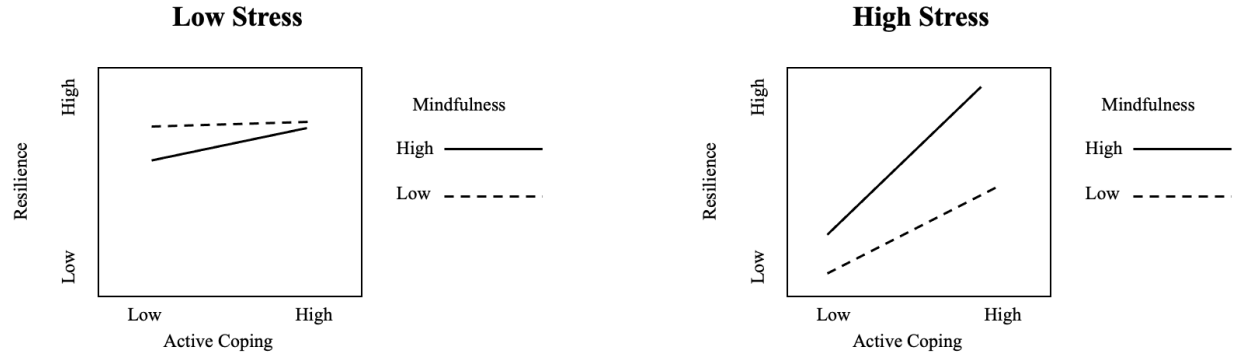
Three-way Interaction: Active Coping X Mindfulness X Psychological Stress Effects on Sustainable Resilience



*Note. The figure shows hypothesis 1; there will be a three-way interaction between active coping, applied mindfulness, and psychological stress and predicting sustainable resilience. AC*AM*PS=SR*

Figure 2

Three-Way Interaction at Low Stress and High Stress.



Note. The figure highlights the proposed hypotheses of the three-way interactions under low stress and high-stress conditions.

3-Way Interaction: Predictions Under Low Stress

The following outcomes are proposed when considering the three-way interaction (Figure 2). Additionally, the numerical ratings associated with the following predications coincides with Table 1, a conceptual table outlining hypothesized resilience levels. Resiliency will be high (4.5) under low psychological stress, low active coping, and low mindfulness. People are not experiencing much stress and therefore do not need to exercise as many coping mechanisms needed to promote resilience.

In a low-stress state, those exhibiting high active coping and low mindfulness will also experience higher resilience (4.5). When people actively cope, they actively seek a path of action toward solving a problem – even when those problems are minimal. Active coping promotes a sense of control, allowing this person to feel a sense of agency over the minimal stressors. Factoring in low mindfulness, this person may lack the ability to slow down or pause the forward motion to check in with oneself and emotionally manage. This lack of emotional attunement to oneself may hinder one's ability to perceive how well they are getting by. Thus, I hypothesize that active coping with minimal mindfulness may lead to a sense of control and an inflated sense of resilience under lower stress.

I predict that resilience will be moderate to high (4) under low stress, low active coping, and high mindfulness. Those experiencing low stress may not feel the need to be proactive in handling the minimal daily stressors of life. However, if someone, even under low stress, is applying a higher level of mindfulness in their daily lives, they are likely more attuned to themselves. They may be more sensitive to even the smallest of life stressors (i.e., they may notice the slightest sense of tension in the body, or a minor thought of discontentment, etc.) and the mental and emotional toll those stressors take. This connectedness to the self may lead to a

slightly dampened resilience perception. One is likely more keenly aware of even the slightest shift in energy one has to be resilient.

Those practicing high active coping and high mindfulness in a low-stress state should experience high resilience (4.5). Under lower stress, any efforts one makes to cope actively are helpful to feel a sense of control and agency in everyday life. Further, under lower stress, any effort to use applied mindfulness as an emotional management strategy is more likely to be resilient. These efforts will also likely proactively build up energy reserves when higher stress moments or seasons eventually arrive.

3-Way Interaction: Predictions Under High Stress

Those under high stress, who have low active coping, but high mindfulness, are likely to experience lower resilience (2). As someone practices mindfulness, they are more likely to be aware of how much stress they have and may even be overly attuned to their stress. This over-attunement could lead to worry, rumination, or overwhelm – especially if someone is under high stress and cannot see a path forward (low active coping). The attunement and awareness of that stress in the present moment with little active coping may render someone feeling stalled or stuck in their stress without knowing which steps to take to make progress. This loss of agency and control would likely lead to lower resilience – not knowing where to begin when trying to "bounce back/forward."

Considering those under high stress, low active coping, and low mindfulness, I hypothesize they will have the lowest resilience (1). Under high stress, one should likely be less able to put one foot in front of the other. They may even begin to feel trapped by the high stress and inaction. This person does not have the mindfulness or benefits of emotional management under these high-stress circumstances that often lead one to change one's circumstances

proactively. As stress rises, one's ability to feel in control of both one's actions and emotions feels further and further away, and one may even begin to cope with more passive or destructive coping mechanisms.

Active coping without applied mindfulness in a high-stress state could cultivate moderate resilience (3). One is actively coping but lacks (or chooses not to engage in) the emotional management of mindfulness to promote resilience (see Table 1). Active coping may force one to cognitively outline the steps required to get through the stressful period, but this sense of agency can only do so much when stress is high. A lack of emotional management with lower mindfulness leaves one feeling worn thin and disconnected from oneself. This person may have "bounced back," but their "head down, put one foot in front of the other" mantra may not help them bounce forward.

In contrast, high active coping and high mindfulness in a high-stress state is hypothesized to lead to the highest resilience (5). This person may default to active coping behaviors as their first response to stress; however, it is not their only path to resilience. This person also relies on applied mindfulness practices to manage one's emotional energy. This combination will likely promote the highest resilience. I hypothesize that when faced with adversity, individuals are most resilient when they actively cope (e.g., taking direct action to get around the problems, taking things "one step at a time") and engage in applied mindfulness (e.g., pausing to relax one's body when tense, awareness, and appreciation of the pleasant events in life, etc.,). The ability to cultivate a cognitive sense of agency and emotional sense of calm under high stress is what I believe to be the optimal path to bouncing forward.

Table 1 numerically summarizes the expected results.

Table 1

Conceptual Table: Hypothesized Resilience Levels Under Three-way Interactions

Psychological Stress (Low-High)	**Active Coping** (Low-High)	**Applied Mindfulness** (Low-High)	**Hypothesized Resilience** (1 = low; 5 = high)
Low Stress (-1 SD)	Low Active Coping	Low Applied Mindfulness	4.5
		High Applied Mindfulness	4
	High Active Coping	Low Applied Mindfulness	4.5
		High Applied Mindfulness	4.5
High Stress (+1 SD)	Low Active Coping	Low Applied Mindfulness	1
		High Applied Mindfulness	2
	High Active Coping	Low Applied Mindfulness	3
		High Applied Mindfulness	5

Note. To better conceptualize the relationships between variables, this table was created to outline hypothesized levels of resilience under conditions of low/high psychological stress, low/high active coping, and low/high mindfulness.

Chapter II: Method

Study Design

A self-report, longitudinal design was used to collect the data. This design is appropriate because this research seeks to understand the prevalence of behaviors (i.e., predictors and moderators) within a sample over time, without manipulation or iteration by the researcher (Sedwick, 2014).

Participants and Procedures

Participants were recruited through the crowdsourcing web service Prolific Academic. Prolific is a platform developed explicitly for researchers incorporating strong recruitment practices and protecting participants' legal rights (e.g., minimum hourly wage) compared to other online platforms (Palan & Schitter, 2018). Using the criteria of internal reliability, naivety, and dishonesty, Prolific performs comparably to Amazon's MTurk platform (Peer et al., 2017). Prolific has advantages over other online sourcing web services, including participants' unfamiliarity with standard research designs and participant pools with a more racially diverse background (Palan & Schitter, 2018). For an adequate sample size of a moderation model, it is suggested that 200 is the minimum to detect an effect (Shieh, 2009). The number recruited for the study was 500. Active coping, psychological stress and applied mindfulness scores were collected at Time 1 on April 24th, 2020, which occurred at the beginning of the COVID-19 pandemic. Sustainable resilience ratings were collected at Time 2, 33 days later, on May 27th, 2020.

At this time, the U.S. was reporting between 25,000-35,000 new COVID-19 cases daily, had approximately 62,594 deaths associated with the virus, and the highest civilian

unemployment rate of the pandemic thus far at 14.7% of the U.S. workforce (Rossen et al., 2020; U.S. Bureau Labor of Statistics, 2020). Further, 30 states were under statewide stay-at-home orders, and 13 additional states had certain counties or cities under stay-at-home orders (Mervosh et al., 2020); it was an exceptional and optimal time to study resilience practices amidst increased psychological stress given the heightened uncertainty.

Preliminary Screening Criteria

Participants were screened to ensure participants were greater than 22 years of age and located in the United States to ensure a representative sample of the US workforce. While participants only received the survey link after agreeing they met study criteria (i.e., U.S. residence and 22 years of age or older), participants were again asked to self-report this information as part of the demographic section of the survey for verification. After assessing census data on the United States for 2019, approximately 50% of the population ages 18-24 were in employed roles. This is construed because some of this group is likely still in high school or starting college and are not traditionally "working age" in the United States. Due to this, the minimum age criteria of 22 was decided. The census data showed that those ages 22-55 had an approximate employment rate of 79.9%; this restriction increased the likelihood that this age group's working conditions were affected by COVID-19.

Additionally, two instructed response items (IRIs) were included within the body of the survey as an attention check of careless participant responses, which is recommended by Meade and Craig (2012) because it increases the likelihood of accuracy of the data captured. The IRIs indicate participants should give one specific response to the question (e.g., “Please select Agree for this item”). Participants who did not answer in alignment with the identified criteria or answered incorrectly to any of the IRIs were deleted from the sample before data analysis.

Participant Sample

At time 1, 507 participant surveys were collected from Prolific Academic. Twenty participants were deleted from the original sample because they either (1) did not meet the study criteria stipulated within the consent form, (2) had greater than 24% item-level missingness for scales with four items and greater than 19% missingness for scales with five or more items, or (3) completed less than 90% of the items within any measure (scale-level missingness). The final sample included 487 participants (see Table 2 for participant demographics). The sample was composed of males (53.6%) and females (43.4%) aged 22-76 (*M* = 36.29, *SD* = 12.55), who identified primarily as White (65%). See Appendix A for detailed information.

At time 2, 464 participant surveys were collected from Prolific Academic. Similarly, 15 were deleted from the original sample due to the same criteria outlined in time 1. The final sample included 449 participants (see Table 3 for participant demographics). The sample was composed of males (52.8%) and females (46.3%) aged 22-77 (*M* = 36.62, *SD* = 12.64), who identified primarily as White (66%). See Appendix A for detailed information.

When combining time 1 and 2 data, the data sets were merged with a unique prolific ID. The final N size for the data used for analyses was N = 441 (see Table 2 for final sample demographics).

Table 2

Participant Demographics: Combined Time 1 and Time 2 Data

	Mean	SD	Range	%	N
Gender					
Male				53.74%	237
Female				47.17%	208
Other				0.45%	2
No response				0.45%	2

Age	36.61	12.68	22-77	
Race				
White			66.21%	292
Asian			12.93%	57
Black			7.48%	33
Latinx			6.35%	28
White/Latinx			2.49%	11
White/Asian			0.91%	4
Asian/Latinx			0.68%	3
American Indian			0.45%	2
Biracial/Mixed Race			0.23%	1
Pacific Islander			0.23%	1
None of the Above			0.23%	1
Declined to respond			0.23%	1
White/Black			0.23%	1
White/Asian/Hawaiian			0.23%	1
White/Latinx/Black			0.23%	1
White/Latinx/American Indian/Other			0.23%	1
Asian/Black			0.23%	1
American Indian/Latinx			0.23%	1
Latinx/Black			0.23%	1

Note. (*N*=441).

Measures

Five measures from the surveys were analyzed to test the hypotheses and proposed model. Each measure is described in the following section, including active coping, applied mindfulness, psychological stress, and the outcome: resilience.

Active Coping

Active Coping was assessed using an adapted version of the COPE active coping sub-scale (Carver et al., 1989; see Appendix B). Slight adaptations were made to emphasize *problem-solving* and *action* orientation. For example, an original item from the COPE scale reads, “I've been taking action to try to make the situation better.” This study wanted to highlight problem-solving orientation and thus adapted the original item to, “I have been taking additional action to

try to get rid of the problems in front of me." Another example is adapting an original COPE scale item to read more action-oriented; the original item reads, "I've been thinking hard about what steps to take." The adaption of the item reads, "I have been doing what has to be done, one step at a time."

The COPE scales have been the most commonly used measure to assess coping behaviors across various situations, including the workplace (Kato, 2015). Multiple studies have established reliability and validity over the three decades (Kato, 2015; Litman, 2006; Lyne & Roger, 2000; Monzani et al., 2015). The active coping sub-scale consists of 4 items rated on a 5-point Likert scale ranging from 1 (*never*) to 5 (*always*). Other example items include "I have been concentrating my efforts on doing something about the situation I am in" and "I have been taking direct action to get around the problems."

Applied Mindfulness

Applied mindfulness was assessed using an adapted version of the Applied Mindfulness Process Scale (AMPS; Li et al., 2016; see Appendix C). The AMPS was developed to evaluate the extent to which people participate in a variety of mindfulness practices in their daily lives. Items were selected based on the extent to which they represented active behavioral practices that encompass the two critical dimensions commonly identified as effective mindfulness practices – taking moments to pause and becoming aware of one's body and surroundings (Baer, 2003; Bishop et al., 2004; Goldberg et al., 2022).

Four items were selected from the AMPS to assess how often a participant has used mindfulness practices in the past seven days (See Appendix C). The items are rated on a 5-point Likert scale ranging from 1 (*never*) to 5 (*almost always*). Example items include, "I relaxed my body when I was tense" and "I was aware of and appreciated the pleasant events in my life."

Psychological Stress

The Perceived Stress Scale (PSS) was used to measure participants' appraisal of situations in their life as stressful (Cohen et al., 1983; see Appendix D). PSS items were designed to evaluate the extent to which respondents found their lives stressful. The hallmarks of how stress is experienced are overloading, unpredictability, and uncontrollability (Averill, 1973; Cohen, 1978; Glass & Singer, 1972; Seligman, 1975).

The PSS is a state measure of perceived stress. The scale consists of five items asking participants to rate the frequency of stressful events that occurred in the past week (e.g., How often have you been upset because of something that happened unexpectedly?) on a scale from 1 (*never*) to 5 (*very often*). The scale also includes several direct queries about current levels of experienced stress (i., In the last week, how often have you felt difficulties were piling up so high that you could not overcome them?).

Resilience

Resilience was assessed using two scales: the Brief Resilience Scale (BRS, Smith et al., 2008), a 6-item scale that assesses the degree to which participants are able to bounce back from stress or an adverse challenge (See Appendix E), and the New General Self-Efficacy (NGSE), an 8-item assessment to evaluate the degree to which participants believe or expect they can perform effectively in demanding situations (See Appendix E).

For the BRS, participants rated the extent to which they agree with each statement on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). There were three positively worded items and three negatively worded items. The negatively worded items were reversed scored, and all 6 items were aggregated into a single score. Example items include "I find it easy to adapt to changing situations" and "I tend to take a long time to get over setbacks in

my life." Similarly, for the NGSE, participants rated the extent to which they agree with statements on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree).* Example items include "I believe I can succeed at most any endeavor to which I set my mind" and "I will be able to successfully overcome many challenges."

The BRS and NGSE scales will be combined by averaging all 14 items computing an average for the BRS and an average for the NGSE, and then calculating an aggregate of the two – weighting them both equally. This method of combination is proposed because it allows for the preservation of the integrity of the scales as separate constructs that I am arguing can and should be merged for the sake of my operationalization of resilience. This combined scale is an assessment of a person's *sustainable resilience (*See Appendix E).

Chapter III: Results

Missing Data

Available item analysis (AIA; Parent, 2013), is a strategy for managing missing data that uses available data for analysis and excludes cases with missing data points only for analyses in which the data points would be directly involved. AIA is also known as pairwise deletion or pairwise inclusion. In most research using multiple-item scales, analysis takes places at the scale level, and thus AIA can be used to generate mean scores for scales using the available data without substituting or imputing values. Parent (2013) suggests that AIA is equivalent to more complex methods (e.g., multiple imputation) across several variations of sample sizes, the magnitude of associations among items, and the degree of missingness. Thus, Parent's (2013) recommendations were used to guide the managing of missing data. Missing data analyses were conducted with the R packages mice (v. 3.13.0), Amelia (v. 1.8.0), and naniar (v.0.6.1).

The threshold for calculating mean scores was set at 90%. At time 1, mean scores were computed for people with at least 90% or more of their items completed. As a result of the 90% threshold, one participant was removed as their item-level missingness was over 85% (the participant filled out the first scale and did not complete the remaining items). Of the cases remaining at time 1, missing values represented .04% of the cases; 99.9% of the cases had non-missing data. At time 2, mean scores were again computed for participants with at least 90% or more of their items completed (as the highest percentage of missingness in the data was 7%). Of the cases remaining at time 2, missing values represented .10% of the cases; 99.7% of the cases had non-missing data. In both cases, when running the mice package on the remaining cases, there was no need to, as the mice package indicated all data were observed. In other words, there was very little missingness in the data at both time 1 and time 2.

Time 1 Data

Time 1 data started with a sample of N = 507. One case was removed for not giving consent to the survey, and an additional 16 were removed for not passing the quality checks throughout the survey bringing the sample size to N = 490. Additionally, two cases show dishonest responding in terms of age limits for the study criteria and did not meet the threshold of 22 years; thus, they were removed (N = 488). One case was also deleted because missingness was 90% or more at the scale level (N = 487).

Scales from the time 1 dataset were calculated using Parent's (2013) recommendation that some reasonable amount of missingness is allowed. Thus, for scales containing four items, up to 25% missingness was allowed; for all others, up to 20% missingness was permitted (N = 487). Then, Little's MCAR test was run, which diagnoses whether the missing observations are missing completely at random. The null hypothesis is that the data is missing completely at random (MCAR), and no patterns will exist in the missing data $\chi^2_{(4)} = 6.45$, $p = .163$. This test suggests that our larger *p*-value ($p > 0.05$) indicates weak evidence against the null hypothesis, so we will fail to reject the null hypothesis.

Time 2 Data

Time 2 data started with a sample of N = 464. Unlike time 1, zero cases were removed for not giving consent to the survey. Next, 13 were removed for not passing the quality checks throughout the survey bringing the sample size to N = 451. Additionally, two cases showed dishonest responses regarding age limits for the study criteria and did not meet the threshold of 22 years; thus, they were removed (N = 449). No instances of missingness were represented as 90% or more (the highest level of missingness was 7% at item level).

Scales from the time 2 data were similarly calculated using Parent's (2013) recommendation that some reasonable amount of missingness is allowed. Thus, for scales containing four items, up to 25% missingness was allowed; for all others, up to 20% missingness was permitted (N = 487). Missingness levels after running R packages mice (v. 3.13.0), Amelia (v. 1.8.0) indicated no patterns exist in the missing data because there was no missing data.

Merging Time 1 & Time 2

Time 1 and time 2 data were merged by participants' unique prolific ID bringing the total number of participants to N = 441.

Common Method Bias

Given the study was done through a single method (survey), Harman's single-factor test was used to assess common method variance (Podsakoff et al., 2003). All variables in the study were loaded into an exploratory factor analysis (EFA) and examined with the unrotated factor solution. The basic assumption of this technique is that if a substantial amount of common method variance is present, either (a) a single factor will emerge from the factor analysis or (b) one general factor will account for the majority of the covariance among the measures. The average variance explained by the factor must be less than .50. The results indicated that there is not common method variance present, as the variance explained was .40 – an acceptable level.

Assumption Testing and Reliability

A review of box plots indicated no outliers were present within the data. At the item levels, data showed skewness and kurtosis within acceptable parameters (i.e., +/- 3; Kline, 2005). Residuals were normally distributed and showed no heteroscedasticity (no funneling/fanning around the fit line). Reliability was assessed using composite reliability (CR; see Table 3). Adequate reliability was found across measures ranging from α = .76 -.94.

Descriptives & Correlational Tables

Table 3 presents means, standard deviations, intercorrelations, and reliability coefficients for the variables measured in this study. The means and standard deviations of the measures indicate satisfactory variation and absence of ceiling or floor effects including psychological stress, which did not appear to be at elevated levels among participants.

Moderate to high reliability was found across measures ranging from α = .76 -.92 with active coping that showed the lowest reliability (α = .76) although still within an acceptable range. A strong and positive correlation (r = .701) between general self-efficacy and resilience suggests that the two constructs are closely related supporting their planned combination to capture both current resilience and future confidence in a single assessment of *sustained resilience*. The predictor variables were moderately related to one another suggesting that they do not overlap but are tapping relatively independent constructs. Active coping and applied mindfulness were moderately correlated (r = .422, p < .001) indicating some relationship but that they were also operating independently from one another. Both active coping s (r = -.174, p < .001) and applied mindfulness (r = -.266, p < .001) were weakly related to psychological stress. Low multicollinearity between the predictors is desirable because high multicollinearity undermines the independent ability of the predictor variables to be independently related to the outcomes due to inflated standard error rates. Multicollinearity similarly limits the amount of variance from interactions that can be predicted in the outcomes. Therefore, the low multicollinearity of the predictors enables a greater ability to determine the predictive power of the independent variables in the regression model.

Zero-order correlations between the predictors and the outcomes were significant and in the expected directions. The two coping strategies -- active coping (r = .389, p < .001) and

applied mindfulness (r = .372, p < .001) were positively predictive of sustained resilience one month later, indicating that these methods are promising for practicing and achieving stronger sustained resilience. Psychological stress was negatively related to sustained resilience (r = -.623), suggesting that psychological stress is negatively related to sustained resilience one month later.

Table 3
Zero-order Correlations, Descriptives, and Reliabilities

	Mean (*SD*)	Range	1	2	3	4	5	6
Predictors (Time 1)								
1. Active Coping	3.33 *(0.72)*	1.0-5.0	**.76**					
2. Applied Mindfulness	2.90 (*0.83*)	1.0-5.0	.422***	**.79**				
3. Psychological Stress	2.77 *(0.86)*	1.0-5.0	-.174***	-.266***	**.86**			
Outcome (Time 2)								
4. General Self Efficacy	3.69 *(.79)*	1.0-5.0	.397***	.356***	-.530***	**.94**		
5. Resilience	3.25 *(.96)*	1.0-5.0	.327***	.332***	-.612***	.701***	**.93**	
6. Sustained Resilience	3.51 (*0.79*)	1.0-5.0	.389***	.372***	-.623**	.906***	.936***	**.95**

Note. (N =441). *p<.05; **p<.01, *** p< .001. Composite reliabilities appear in bold on the diagonal.

Hypothesis Testing

The hypothesis that there will be a three-way interaction between active coping, psychological stress, and applied mindfulness in the prediction of sustained resilience was tested and was not supported (See Table 4).

Table 4

Three-way moderation regression table

Variable	*b*	*SE*	*t*	*F*	R^2
Intercept	5.55***	1.072	5.184		
Model 1				134.5	.481***
Active Coping (AC)	-0.164	.343	-.478		
Applied Mindfulness (AM)	-0.579	.392	-1.474		
Psychological Stress (PS)	-1.275**	.402	-3.167		
Model 2				68.67	.488***
AC* AM	.154	.116	1.326		
AC* PS	.173	.133	1.299		
AM*PS	.280+	.154	1.818		
Model 3				59.2	.490***
AC*AM*PS	-.062	.048	-1.305		

Note. (N=441). +p<.10, *p<.05; **p<.01, ***p<.001. AC = Active Coping, AM = Applied Mindfulness, PS = Psychological Stress.

Figure 3

Three-way Interaction: Active Coping X Mindfulness X Psychological Stress Effects on Sustained Resilience

Figure 3 represents a visual representation of the three-way moderation. Although not significant, the patterns of the relationships differ from those proposed. Contrary to expectations, the results suggest, if power was higher, a potential synergistic pattern under low stress. Meaning that under low stress, the association between active coping and sustained resilience tended to strengthen with increased mindfulness (i.e., higher levels of active coping and applied mindfulness will have even greater levels of sustained resilience). Under high stress a potential compensatory pattern is suggested where either active coping or applied mindfulness can improve resilience. Hence, mindfulness and active coping compensate for each other (i.e., "compensatory;" Cohen et al., 2003; Trautwein et al., 2015).

The significance level of the two-way interaction between applied mindfulness and psychological stress on sustained resilience had a significance level of $p = .07$. Because it approached significance, a two-way interaction was further explored in a post- hoc analysis.

Post-hoc Analyses

The non-significant results of the three-way interaction indicated two areas for potential post hoc analyses. First, the combined main effects of active coping and mindfulness were tested to assess their combined effects on sustained resilience independent of stress level; second, the suggested 2-way interaction of applied mindfulness and stress on sustained resilience was tested.

Combined Effects of Active Coping and Mindfulness on Sustained Resilience

The relationships in the correlational matrix (see Table 3) suggested both active coping and mindfulness were related to sustained resilience; thus, a post-hoc was conducted to assess the combined prediction of active coping and mindfulness on sustained resilience (see Table 5).

Table 5

Main effects of Active Coping and Applied Mindfulness on Sustained Resilience

Variable	*b*	*SE*	*t*	*F*	R^2
Intercept	1.695***	.174	9.733	55.67	.203***
Active Coping	.316***	.053	5.977		
Applied Mindfulness	.250***	.047	5.356		

Note. (N=441). *p<.05; **p<.01, ***p<.001.

Active coping with applied mindfulness explains 20.3% of the variance when predicting sustainable resilience (R^2 = .203) suggesting that engaging in both practices was more strongly related to sustained resilience than either active coping (r^2 = .151) or mindfulness (r^2= .138) by themselves [R^2 values were calculated by squaring the correlation coefficients in Table 3].

Two-Way Interaction between Mindfulness and Stress on Sustained Resilience

Next, a two-way interaction was tested to assess the potential interaction between mindfulness and sustained resilience at differing stress levels (See Table 6 and Figure 4). The results suggest a significant two-way moderation between mindfulness and sustained resilience at different stress levels (b = .080, p < .05).

Table 6

Two-way *moderation regression table (Linear)*

Variable	*b*	*SE*	*t*	*F*	R^2
Intercept	4.842***	.306	15.826		
Model 1				167 .0	.434***
Applied Mindfulness	.024	.099	0.243		
Psychological Stress	-.752***	.109	-6.900		
Model 2				113.7	.440***
AM*PS	.080*	.039	2.108		

Note. (N=441). *p<.05; **p<.01, ***p<.001. AM = Applied Mindfulness, PS = Psychological Stress.

Figure 4

Two-way Interaction: Mindfulness X Psychological Stress Effects on Sustained Resilience

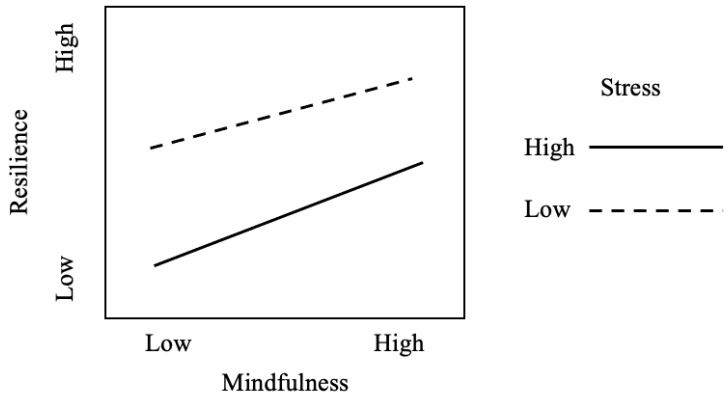


Table 7

Two-Way *Moderation Simple Slopes at -1 SD, Mean, And +1 SD of Psychological Stress*

Variable	*b*	*SE*	*t*
Stress (- 1 SD = 1.88)	.17***	.04	4.08
Stress (Mean = 2.73)	.24***	.04	6.31
Stress (+ 1 SD = 3.59)	.31***	.06	5.47

Note. (N=441). *p<.05; **p<.01, ***p<.001.

Table 7 provides the simple slopes at varying stress levels and should be used to better interpret the graphs in figure 4. At low stress (-1 SD), for every 1-point increase in applied mindfulness, there is a .17 increase in sustained resilience. At high stress (+1 SD), for every 1-point increase in applied mindfulness there is a .31 increase in sustained resilience. Thus, higher stress has a steeper slope, indicating mindfulness has a higher impact on sustained resilience at high levels of stress.

Further analysis was conducted to assess the potential presence of a nonlinear relationship when plotting the data at different stress levels (Long, 2019). Non-linearity was suspected after considering possible boundary conditions for psychological constructs (Grant & Schwartz, 2011). At very high levels, mindfulness may involve an excessive focus on the present at the expense of planning for the future (Grant & Schwartz, 2011; Pierce & Aguinis, 2013). In

addition to a hyper-focus on the present, one might be focused too internally (on one's emotions or sense of self) to promote resilience.

Results indicated the potential presence of a non-linear relationship for applied mindfulness at varying degrees of stress, so a two-way moderation polynomial regression was conducted and graphed (See Table 8). Figure 5 visualizes the polynomial relationship between mindfulness and resilience at high (+1 SD) and low (-1 SD) stress. Active coping was also tested for non-linearity at different stress levels, however, results indicated linearity.

Table 8

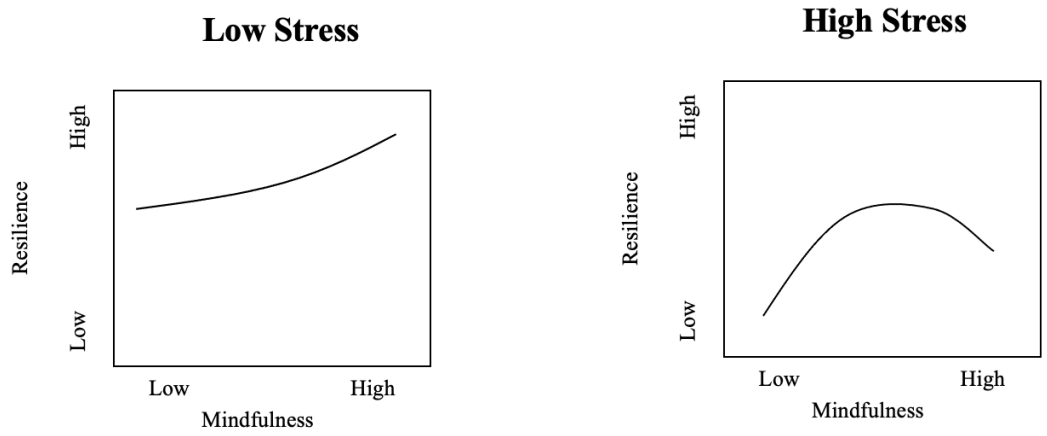
Two-Way *Moderation Regression Table (Quadratic)*

Variable	*b*	*SE*	*t*	*F*	R^2
Intercept	4.897***	.105	47.752		
Model 1 (Main Effects)				167 .0	.434***
Applied Mindfulness (AM)	.024	.099	0.243		
Psychological Stress (PS)	-.752***	.109	-6.900		
Model 2 (Linear)				113.7	.440***
Applied Mindfulness (AM)	1.724	1.812	0.952		
Psychological Stress (PS)	-.524***	.037	-14.106		
AM*PS	.647	.717	.902		
Model 3 (Quadratic)				70.51	.449***
Applied Mindfulness^2 (AM^2)	4.075*	1.774	2.297		
AM^2*PS	-1.893**	.712	-2.659		

Note. (N=441). *p<.05; **p<.01, ***p<.001. AM = Applied Mindfulness, PS = Psychological Stress.

Figure 5

Polynomial Two-way Interaction: Mindfulness^2 X Psychological Stress Effects on Resilience



The results suggest a significant quadratic two-way moderation between mindfulness and sustained resilience at different stress levels (b = -1.893, p < .01). At high stress (+1 SD), mindfulness effectively increases sustained resilience until it reaches moderate levels (i.e., engaging in mindfulness "*sometimes")*, and then it plateaus and starts to decrease. In practice, this may indicate that individuals need to engage in "enough" mindfulness in high stress situations, but practicing too much applied mindfulness doesn't result in any gain and may actually decrease sustained resilience (although the number of participants represented at the highest level of mindfulness level was limited, making inferences at this highest level more speculative and in need of future research).

Finally, an ANOVA test was used to compare the fits between the linear and quadratic models (Table 9).

Table 9

ANOVA Table Comparing Linear and Quadratic Model

Variable	Sums of Squares	*df*	Mean Square	*F*	*p*
Linear Model (Table 5)	161.37				
Quadratic Model (Table 6)	158.69	2	79.345	3.649	.027*

Note. (N=441). *p<.05; **p<.01, ***p< .001.

The ANOVA suggests that the more complex quadratic model is significantly better at capturing the data than the simpler linear model. The resulting p-value is sufficiently low (p<.05), and thus, the quadratic model is statistically favorable model (the difference in R^2 between the linear and quadratic models is slight, ΔR^2 = .009); but practical significance is more limited; the difference being roughly a 1% increase in prediction with the polynomial model.

In summary, this suggests that if one is not yet doing mindfulness, even getting to an average level may boost sustained resilience levels. Additionally, once one is practicing mindfulness, maintaining a moderate level (i.e., *"sometimes"*) may be optimal. Under low stress (-1 SD), sustained resilience scores are generally high, and the relationship appears to be more linear indicating that that the effects of applied mindfulness on sustained resilience do not plateau.

Chapter IV: Discussion

The current study aimed to explore the relationships between active coping and applied mindfulness with sustained resilience under varying levels of psychological stress, hypothesizing that under low stress active coping or applied mindfulness would interact such that either would be important and related to sustained resilience one month later (i.e., a compensatory effect). In contrast, under high stress, applied mindfulness and active coping would synergistically interact to predict later sustained resilience

Results indicated a three-way interaction was not supported. However, consistent with previous research, active coping and applied mindfulness were positively predictive of sustained resilience independently and additively when combined (Hunter et al., 2018; Hill & Updegraff, 2012; Robertson et al., 2015, Tabibnia & Radecki, 2018). Additionally, also consistent with previous research, stress was negatively related to later sustained resilience (Belise et al., 2017; Diorio et al., 1993; Lupien et al., 2009; Radley et al., 2006; Sonnentag & Frese, 2013).

Second, the results suggested a significant two-way interaction between mindfulness and sustained resilience at different psychological stress levels. Specifically, the results suggest that a curvilinear relationship (i.e., quadratic relationship) exists between mindfulness and sustained resilience at varying levels of psychosocial stress. Findings illustrate a linear relationship at low levels of stress and a curvilinear relationship at higher levels of stress, with moderate levels of applied mindfulness most strongly related to sustained resilience one month later. The following paragraphs outline how the findings of the post-hoc analyses compare to existing research.

Active coping and mindfulness have significant positive relationships with sustained resilience, and this is consistent with previous research that these are effective sustained resilience practices (Tabibnia & Radecki, 2018; Hunter et al., 2018; Robertson et al., 2015, Hill

& Updegraff, 2012). Active coping allows one to change a stressful situation, exert control, and strengthens the brain's neural ability to take control in the future (Zacher & Rudoplh, 2020). Thus, the results of this study are consistent with previous research that indicates engaging in active coping can reduce future anxiety through a rerouting of neural pathways, making it easier to be proactive again in the future. However, the key is for coping to be *active* rather than passive (Tabibnia & Radecki, 2018). Practical implications for active coping will be discussed in the following section.

Most research on mindfulness is concerned with its relationship to subjective well-being and life satisfaction (e.g., Bajaj & Pande, 2011; Holzel et al., 2011; Sayers et al., 2015). Limited research has examined the relationship between mindfulness and resilience and has identified a linear relationship to the outcome variable (Davidson & Begley, 2012; Foureur, et al., 2013; Keye & Pidgeon, 2013; Pidgeon & Keye, 2014; Smith et al., 2011; Thompson et al., 2011). The current study adds to this body of research with results that indicate stress may moderate the relationship such that under high levels of stress there is a potential non-linear relationship. The results of this study indicate that one should consider doing moderate mindfulness under high stress because there is a potential plateauing effect on sustained resilience at high levels of mindfulness (or possible negative relationships with sustained resilience at high levels of mindfulness).

The idea of curvilinearity is not foreign to the social sciences. For example, Pierce and Aguinis (2013) suggest there can be "too much of a good thing;" that seemingly linear relationships can reach "context-specific inflection points" after which the relationships turn "asymptotic and even negative, resulting in an overall pattern of curvilinearity" (p. 313). They argue that there is no such thing as an unmitigated good, especially related to psychological

constructs. For instance, Grant and Schwartz (2011) hypothesized that mindfulness is likely to have curvilinear effects and recommend that researchers study its boundary conditions more carefully.

Some researchers have considered the curvilinear effects of mindfulness (Tabibnia & Radecki, 2018). For example, when studying cancer patients undergoing chemotherapy, mindfulness training was associated with increased symptoms of distress, social avoidance, and reduced quality of life (Reynolds et al., 2017). Therefore, these authors caution against using mindfulness-based interventions during the acute stage of illness. One might infer that during a critical phase of illness, someone could be experiencing higher stress levels due to the uncertainty and one's perceived ability to cope with the present condition. Spending an imbalanced amount of time practicing mindfulness might worsen anxiety after a certain point as one might wish their time were spent "solving the problem" or gaining a sense of agency (Grant & Schwartz, 2011). Adding to the research, Britton (2019) investigates further by looking at mindfulness-related processes for signs of non-linearity (i.e., non-monotonicity; an inverted U-shaped trajectory). In her review, the outcome studied is *well-being* and stress was not a studied factor. Therefore, the monotonicity of mindfulness has yet to be studied alongside sustained resilience and stress, until now.

Theoretical Implications

In the words of Viktor Frankl, "Between stimulus and response, there is a space. In that space is our power to choose our response. In our response lies our growth and our freedom (Covey, 2004, p.42)." Bandura's (2006) theory of human agency lends a framework for how one can achieve said growth and freedom. By forming intentions, one can set a vision for their path in a situation or in life. Once the vision is cast, one gives forethought by setting goals to increase

one's motivation. These two factors alone give a sense of direction, especially in moments/times of stress (stimulus). One's ability to react and self-regulate in the moment is the essence of Frankl's quote. One's ability to choose, pivot, direct one's own life – that is the key to unlocking growth and freedom for oneself. As one continues to hone the power of choosing one's response, one can reflect and self-examine, which guides the next choice, and the choice after. Ultimately, one can create a life of growth and freedom as a product of one's [human] agency.

Notably, active coping and applied mindfulness accounted for approximately 20% of the variance in sustained resilience 1 month later, and they are more predictive together than separate (additive effect). From a theoretical perspective, this adds to Bandura's (2006) theory of human agency in that to cultivate resilience people may draw heavily on the agency dimensions of *intentionality* and *forethought* to actively cope. However, to sustain resilience under varying life circumstances, one might need to access dimensions of self-reactiveness and self-reflectiveness (i.e., incorporating more applied mindfulness). Future researchers should consider coping strategies (or resilience mechanisms) beyond active coping and applied mindfulness. Future studies could further this research by identifying the most critical coping strategies given the wide variety of possibilities (i.e., the numerous different coping approaches and strategies), but limited resources people have (Tabibnia & Radecki, 2018). When examining other resilience practices, specifically psychological constructs, future researchers should also pay close attention to curvilinear effects as it relates to varying stress levels.

Lastly, another area of future research to investigate are mediating effects. Researchers should consider mediators such as internal locus of control, state anxiety, and emotional regulation that could help explain the mechanisms between the coping actions and sustained resilience, providing insights into which may operate linearly or non-linearly. These two

elements were tangential to active coping and mindfulness, however, could play an important role.

In the words of Bandura, there is much to explore between human agency and, “the challenges center on how to enlist these agentic human capabilities in ways that shape a better and sustainable future (p. 177).” In the spirit of sustainability, the next section will cover practical implications for strategies to promote sustainable resilience.

Practical Implications

Practical implications will be discussed for both active coping and mindfulness and will follow the following order: (1) individual level, (2) managerial level, and (3) organizational level. These three levels are identified to lend greater insight to the field of organizational psychology and increase the likelihood of practical application. In this study the individual level was prioritized due to its generalizability. Managerial and organizational inferences were informed through individual level findings and should be interpreted with this lens. All three levels will be addressed; however, the individual level will be the primary focus since that was the level of analysis in this study.

Individual Level

Active Coping. At the individual level, active coping might look like intentionally asking oneself coaching questions. Based on the operationalization of active coping used in this study (Carver, 1997), individuals at the highest levels of sustained resilience are more likely to consider: “What is the ideal outcome? What is currently preventing me from getting there? Given the obstacles, how can I still achieve the ideal outcome? What is the next step?” (Whitmore, 2009).

Next, when working on larger-scale projects, individuals can explore how to divide the work into small phases with each phase consisting of smaller tasks. Break the tasks down by asking, "What is the smallest next step?" Having the tasks plotted out in small stages makes taking the next step easier (Amabile & Kramer, 2011; Luna & Renninger, 2021). Dopamine is released in the brain when these tasks are accomplished, enhancing motivation toward the larger project (Amabile & Kramer, 2011).

Another strategy is to identify what one knows and doesn't know in uncertain situations. Regularly delineating between knowns and unknowns creates a sense of agency over the situation, making it easier to act toward what is within one's internal locus of control (Grant, 2021).

Lastly, when it comes to task management, one can list out all the tasks one has for the week, but daily, *only* select a short list of the things that are prioritized on a must-do list. Having this short list reduces overwhelm; having the larger list of all one's tasks helps create a sense of control and organization (i.e., one's thoughts are not floating in the abyss). Daily renegotiating the list of top priorities allows for more frequent active coping which helps to reduce overwhelm and increase energy and focus on what's important (Bregman, 2020; Boyles, 2018; Luna & Renninger, 2021). Additionally, this make it more noticeable when one accomplishes a goal, which increases self-efficacy, motivation, and agency (Bandura, 2006).

Applied Mindfulness. Based on the results of this study, applied mindfulness as it relates to sustained resilience, might consist of taking regular breaks. For instance, setting a timer on one's phone to interrupt oneself throughout the day. During breaks, a person might do a body scan to assess their level of stress and relax. In this way, a person can start at the top of one's head and focusing on releasing bodily tension (Chiesa & Malinowski, 2011; Josefsson et al.,

2014). These short brain breaks support mindfulness and are suggested to increase decision-making skills (Hafenbrack et al., 2014) and improve attention and focus (Norris et al., 2018).

Second, individuals can deliberately observe their thoughts in a detached manner which cultivates healthy separation and cognitive flexibility (Moore & Malinowski, 2009). Thought observation also helps individuals deliberately reduce the worries of everyday life and decrease unpleasant thoughts and feelings (Chiesa & Malinowski, 2011). When concerns, ruminations, or negative emotions arise, take a moment to name the feeling by saying to oneself, "I notice I'm having a thought of…" or "Thanks [brain] for this interesting thought…" or, "The story I am telling myself is…." This skill is called "diffusion" and is a technique used in cognitive-behavioral therapies, ACT (Acceptance and Commitment Therapy), and DBT (Dialectical Behavior Therapy; Bass et al., 2014; Chiesa & Malinowski, 2011). Diffusion creates space between one's thought and reality, allowing oneself to decide more objectively whether it's worth it to "fuse" with said thought.

Next, to regularly decrease unpleasant thoughts and feelings, one might consider the verbal expression of one's emotions or affect labeling as practical tools for regulating stress. When one labels one's affect, it converts what is traditionally an emotional process into a more cerebral experience, reducing emotional reactivity (Tabibnia & Radecki, 2018). Labeling emotions can also promote an acceptance of one's emotions and can help with further emotional management (Shallcross et al., 2015). For example, if under high stress, one might label one's emotions by saying, "I am feeling overwhelmed right now." By labeling one's emotions, one begins to strengthen the neural pathways to the frontal cortex, a region of the brain responsible for logical thinking and processing (Lieberman et al., 2007; Ochsner & Gross, 2005).

Lastly, practicing gratitude is important. Celebrate small wins to appreciate the pleasant events in everyday life (Amabile & Kramer, 2011). Expressing gratitude to another person (e.g., by writing a thankful letter) can also be an effective strategy to increase awareness and appreciation of one's life (Kaczmarek et al., 2015). Another strategy might be journaling or reflecting on one's daily fortunes or accomplishments. Wood et al. (2010) studied the impact of participants keeping a gratitude journal, which consists of writing down three things one is grateful for each day. Practicing gratitude is also suggested to reduce stress and enhance psychological and physical well-being (Hill et al., 2013; Seligman et al., 2005). When expressing gratitude, one does not need to be grateful *for* the adversity itself, but genuinely reflective of what one *is* grateful for.

As noted earlier, this study indicated that under high stress, it may be best to engage in these practices at moderate levels ("sometimes" as opposed to "often" or "almost always"). For example, it might look like noticing tension in one's body and relaxing it when tense every so often throughout the week. This might look like an individual scheduling an alert (i.e., calendar block or phone alarm) one to two times a week to pause and check in. On the other hand, it might consist of noting what one appreciates or is grateful for on occasion throughout the month. This might look like a reflective journal entry once or twice a month, or occasionally naming a few things one is grateful for before going to sleep. These would be examples of what "good enough" mindfulness might look like to experience optimal resilience under high stress.

Managerial Level

Active Coping. As a manager, there are many ways to support the team's active coping efforts. First, help direct reports break projects into phases to reduce the cognitive load of trying

to accomplish it all at once. Second, help team members have tradeoff conversations around daily workloads and prioritization (i.e., “If I do this, then I can’t do that.”)

When coaching one’s team, consider the following ideal windows for coaching them on taskwork. The beginning of the team’s task cycle should focus on effort-related interventions, the midpoint should focus on strategy-related interventions, and the end of the task cycle should focus on interventions that address knowledge and skills to complete the task (Salas et al., 2008; Wageman, 2005, Hackman & Wageman, 2005). For instance, this might look like initiating “stop/start/change” conversations midway through project work to encourage reflection and observation of how the processes are or are not working. Likewise, after project work or sprints, hold standardized retrospectives to understand what went well and what did not. The findings should inform the next iteration of work and should be documented for ease of use in the future.

Lastly, give actionable feedback to equip team members to cope actively. Give feedback that produces results such as increasing effectiveness and improving performance (Shute, 2008). Managers should provide honest assessments of the work to determine what to do better. Without feedback about their performance, team members can have difficulty figuring out how to improve (or actively cope). Additionally, praise employees who actively problem-solve, even if their efforts fail; this signals that active coping is better than passive coping or avoidance of issues. Positive feedback boosts efficacy and confidence, increasing team members’ ability to handle future challenges (Cannon & Whitherspoon, 2005).

Applied Mindfulness. Managers can provide a transparent space for team members to share how they are doing. For example, this might include talking through “wins and challenges” in weekly 1-1s or doing a round-robin in weekly meetings to share “frustrations and insights.” Having a place to share allows the team member to appreciate the pleasant things and let go of

the unpleasant. Next, celebrate small wins or successes or take time as a team to express gratitude (i.e., add small wins and/or learning extractions into 1-1 templates with direct reports). Lastly, use one's authority as a leader to call for breaks. For example, if a performance review or meeting becomes contentious or emotional, suggest taking a 2–5-minute break for both parties to relax their body, let go of unpleasant thoughts/feelings, and regain clarity (if working virtually, suggest a 2-5 minute "camera-off" break).

Organizational Level

Active Coping. Organizations can establish a consistent and transparent strategic planning system. Make it easier for individuals to actively cope by making balanced scorecards, KPIs (Key Performance Indicators), and OKRs (Objective and Key Results) accessible and transparent (Kaplan & Norton, 2007). There should be a clear structure and cadence to the strategic planning systems (Hill & Jones, 2014). For example, this might include an operating cadence of annually, quarterly, and weekly to create and review progress on OKRs and KPIs. Having a structured process enables stakeholders to pivot within a reasonable timeframe, which is vital to actively cope as an organization. Organizations could ensure that all employees have access to OKRs, the vision, and strategy for the next year or more. Making smarter decisions for the business at all levels means employees know what is most important in the near and long term (Gothelf, 2001; Hill & Jones, 2014). Additionally, employees will have better insight into why and may have even seen it coming when changes are made (Everse, 2011; Kenny, 2021).

Second, use responsibility assignment matrices for clarity on roles and responsibilities. The DACI model (Driver, Approver, Consulted, and Informed) or RACI matrix (Responsible, Accountable, Consulted, and Informed) are examples of a systematized structure that fosters clarity around planning and decision making (Frisch & Greene, 2016; Hyväri, 2016).

Organizations can make it clear who owns what and how each person contributes. This removes the guesswork from employees, making it so decisions can be acted upon quickly and easily, and employees can continue to actively cope while solving workplace problems.

Applied Mindfulness. First, organizations might consider instituting an employee wellness program (Berry et al., 2010). Organizations can give employees access to apps and programs for meditation and yoga (e.g., Shine, Meditation Studio, Headspace, Yoga Ed. and Calm). There are many apps and training programs available for improving wellness and mindfulness. Workout apps like Nike Training Club, ClassPass, and Peloton also offer on-demand yoga and meditation classes. These apps are relatively inexpensive and easy to implement via corporate partnerships.

Additionally, organizations and teams can establish norms for not working during non-work hours (i.e., “dark hours”; Thomas, 2015). By honoring dark hours, employees can detach from the frustrations and stress of work and return refreshed. To establish these norms, leadership should create clear communication guidelines to reinforce unplugging during evenings, weekends, and while on vacation.

Lastly, offer training on mindfulness and meditation (Baer, 2003; Donaldson-Feilder et al., 2019; Hülsheger et al., 2013). A half-day to full-day course can introduce basic practices, such as breathing or body scan meditations, so that employees can subsequently continue their mindfulness or meditation practices. To reinforce their training courses, offer guided meditations during working hours (e.g., like Google, LinkedIn, General Mills, and Twitter; Schaufenbuel, 2015). For example, Google has also established silent lunches and silent rooms, where employees can go to readjust their mindsets during an intense working day.

Limitations and Future Research

The most significant limitation in the current research is that, because there was no random assignment to groups where the independent variables were manipulated, causal statements cannot be made from this research (Shaddish et al., 2002). The longitudinal nature of the study with collection of the predictor variables at one point in time and sustained resilience collected one month later, suggests the potential for a causal link, but an experimental design to test the observed relationships would be a valuable future research step. Furthermore, future research could investigate reciprocal relationships as well; for example, whether active coping (mindfulness) causes sustained resilience or whether sustained resilience causes active coping (mindfulness), or if they are reciprocally reinforcing. Thus, to increase internal validity, one might consider an experimental design where researchers design an intervention to manipulate either active coping or applied mindfulness. For example, an experimental group might attend a meditation class or training and their results would be compared to people who did not take the training.

Secondly, researchers might also consider methods of measurement that minimize mono-operation bias. Mono-operation bias is present because each construct is only measured through one operationalization. One possibility is to explore other ways to assess psychological stress; instead of measuring stress solely through self-reported measures, researchers could purposefully create an intervention to induce stress. For example, one could induce stress by using the *cold pressor test,* a cardiovascular test performed by immersing the hand into an ice water container, usually for one minute, and measuring changes in blood pressure and heart rate (Bali & Jaggi, 2015).

Another limitation of this study is its mono-method bias (Saddish et al., 2002). As mentioned [in the results section under common method bias], Harman's single factor test was

used to test for common method bias (Podsakoff et al., 2003). Average variance explained by the single factor must be less than .50, and when tested, the average variance explained was 40%, which is acceptable – but still high. Future research would benefit from using multiple methods and multiple operationalizations of the variables. In other words, future research should consider capturing data from multiple sources. For instance, researchers might consider obtaining a 360 rating from a partner, friend, or colleague to assess sustained resilience. Additionally, researchers may introduce a more blended approach by using qualitative methods such as grounded theory, consensual qualitative research (CQR), or ethnography to gain more context for the quantitative ratings (Creswell et al., 2007; Hill, 2012).

Future research should use qualitative methods alongside quantitative measures to explore how people's perceptions of their sustained resilience map to the intensity of adversity in their lives. For example, one topic researchers could investigate under this programmatic design is whether the coping strategies that help people manage the stress of other life challenges (and traumas) such as dealing with racism. For example, compared to their White counterparts, Black Americans are more likely to face poverty, live in violent neighborhoods, have fewer financial resources, and have higher mortality rates from disease (Brown, 2008). The existing literature would benefit from understanding the varying grades of adversity people experience based on identities and what coping strategies are most effective to increasing their sustained resilience. Thus, future research should use longitudinal designs with theoretically supported time lags and broaden the study of sustained resilience to people who may face significant adversity.

Another area of consideration for future researchers is to investigate whether coping styles work synergistically, compensatory, or additively with one another (Hobfoll, 2001; Southwick & Charney, 2012). Researchers should test whether resilience practices are

promotional; that is, whether engaging in one resilience practice will promote positively engaging in other resilience practices. For example, six-month follow-up assessments in a multiple health behaviors study indicated that those who were assigned exercise as the targeted catalyst behavior had significantly reduced risky health behaviors such as stress, poor diet, and smoking (Prochaska et al., 2012, 2008) which in turn increased overall well-being (and the domains of emotional health, physical health, life evaluation, and healthy behaviors). If some coping strategies hold catalytic properties, this could help people tailor their coping approaches to maximize their efforts.

Lastly, future researchers could institute a programmatic research design to understand coping across the lifespan. Much of the sustained resilience literature to date has been studied in children or clinically; far less is known about the process of sustained resilience in adulthood, and even less research has followed individuals over their lifetime to ascertain the value of protective factors as people age (Windle, 2011).

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Appendix A

Participant Demographics for Time 1 on April 24th, 2020 and Time 2 on May 27th 2020

Table 2

Participant Demographics for Time 1 on April 24th, 2020

	Mean	SD	Range	%	N
Gender					
Male				53.59%	261
Female				45.38%	221
Other				0.41%	2
No response				0.62%	3
Age	36.29	12.55	22-76		
Race					
White				64.89%	316
Asian				13.35%	65
Black				6.78%	33
Latinx				6.37%	31
White/Latinx				2.87%	14
White/Asian				0.82%	4
American Indian				0.62%	3
Declined to respond				0.62%	3
White/Black				0.62%	3
White/Asian				0.41%	2
White/Latinx/Multiracial				0.41%	2
Asian/Latinx				0.41%	2
Asian/Black				0.41%	2
Pacific Islander				0.21%	1
None of the Above				0.21%	1
White/Middle Eastern				0.21%	1
White/Black/Asian				0.21%	1
White/Asian/Hawaiian				0.21%	1

Note. (*N*=487).

Table 3

Participant Demographics for Time 2 on May 27th, 2020

	Mean	SD	Range	%	N
Gender					
Male				52.78%	237
Female				46.33%	208
Other				0.45%	2
No response				0.45%	2
Age	36.62	12.64	22-77		
Race					
White				66.15%	297
Asian				12.92%	58
Black				7.57%	34
Latinx				6.24%	28
White/Latinx				2.67%	12
White/Asian				0.89%	4
Asian/Latinx				0.67%	3
American Indian				0.45%	2
Biracial/Mixed Race				0.22%	1
Pacific Islander				0.22%	1
"None of the Above"				0.22%	1
Declined to respond				0.22%	1
White/Black				0.22%	1
White/Asian/Hawaiian				0.22%	1
White/Latinx/Black				0.22%	1
White/Latinx/American Indian/Other				0.22%	1
Asian/Black				0.22%	1
American Indian/Latinx				0.22%	1
Latinx/Black				0.22%	1

Note. (*N*=449).

Appendix B

COPE: Active Coping Sub-scale

Now, we want to hear about the **strategies** you are using to cope with the challenges and opportunities in your life right now. Of course, different people rely on different strategies. No one does them all. We are interested in finding out the strategies that you have used over the past week. Don't answer on the basis of whether they seem to be working or not—just whether or not you're doing them.

Directions How often have you engaged in the following actions **in the last week**?
Scale is from 1-5. [1= Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Almost Always]

1. I have been concentrating my efforts on doing something about the situation I am in.
2. I have been taking additional action to try to get rid of the problems in front of me.
3. I have been taking direct action to get around the problems.
4. I have been doing what has to be done, one step at a time.

Note. Scale is from 1-5. [1= Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Almost Always]

Appendix C

Applied Mindfulness Scale

Directions: How often have you used **mindfulness** to do the following **in the last week**?
Scale is from 1-5. [1= Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Almost Always]

1. Observed my thoughts in a detached manner.
2. Relaxed my body when I was tense.
3. Was aware of and appreciated the pleasant events in my life.
4. Let go of unpleasant thoughts and feelings.

Note. Applied Mindfulness Scale (adapted from the Applied Mindfulness Process Scale, AMPS, Li, Black, & Garland, 2016).

Appendix D

The Perceived Stress Scale

Directions: Think about how often you felt or thought about the following things **during the last week**.
Scale is from 1-5. [1= Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Almost Always]

1. In the last week, how often have you felt that you were unable to control the important things in your life?
2. In the last week, how often have you felt confident about your ability to handle your personal problems? (R)
3. In the last week, how often have you felt things were going your way? (R)
4. In the last week, how often have you felt difficulties were piling up so high that you could not overcome them?
5. In the last week, how often have you felt significantly challenged because of the impact COVID-19 has had on your life?

Note. The Perceived Stress Scale (adapted from the The Perceived Stress Scale, PSS; Cohen, Kamarck, & Mermelstein, 1983).

Appendix E

Combined Brief Resilience Scale and New General Self-Efficacy Scale

Brief Resilience Scale
Directions: Please indicate the extent to which you agree with each of the following statements. *Scale is from 1-5. [1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree]*

1. I tend to bounce back quickly after hard times
2. I have a hard time making it through stressful events (R)
3. It does not take me long to recover from a stressful event
4. It is hard for me to snap back when something bad happens (R)
5. This item is to check if you're paying attention. On this item, please answer 3 "Neutral"
6. I usually come through difficult times with little trouble
7. I tend to take a long time to get over set-backs in my life (R)

Note. (R) is reversed scored.

New General Self Efficacy Scale
Directions: Please indicate the extent to which you agree with each of the following statements. *Scale is from 1-5. [1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree]*

1. I will be able to achieve most of the goals that I have set for myself.
2. When facing difficult tasks, I am certain that I will accomplish them.
3. In general, I think that I can obtain outcomes that are important to me.
4. I believe I can succeed at almost anything I set my mind to.
5. I will be able to successfully overcome many challenges.
6. I am confident that I can perform effectively on many different tasks.
7. Compared to other people, I can do most tasks very well.
8. Even when things are tough, I can perform quite well.

Note. Combined Brief Resilience Scale. (Smith et al., 2008) and New General Self-Efficacy Scale (original scale; General Self-Efficacy Scale Sherer et al., 1982; adapted from Chen & Gully, 1997).

Appendix G

Demographic Questions

Directions: Please provide the following information:

1. What is your age? [Please enter the numbers of years]

    a. _____

2. Please indicate your ethnicity. Mark all that apply: (optional)

    a. Asian or Asian American
    b. Black or African American
    c. Hispanic, Latinx
    d. White, Caucasian
    e. American Indian/ Native American
    f. Other (write in): _____

3. Please indicate your gender

    a. Male
    b. Female
    c. Prefer to self-describe: