

EFFECTS & LIMITATIONS OF COGNITIVE REAPPRAISAL
FOR STRESS REGULATION

by

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Submitted to the Psychology Department
School of Natural and Social Sciences
in partial fulfillment of the requirements
for the degree of Bachelor of Arts

Purchase College
State University of New York

Spring 2023

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Abstract

Stress is a natural function that people often mistakenly turn into a calamity. People use many strategies to cope with stress and some of those strategies may be more effective than others. An inability to properly identify and approach stress can lead to maladaptive behaviors that do not relieve stress, but instead exacerbate its consequential effects in the long term. The aim of this thesis is to review the literature on stress, including effects of both successful and maladaptive coping strategies and their limitations. Specifically, the first sections of the paper discuss: (1) the threat detection response (Acute Stress) and understanding its biological purpose for means of survival, (2) How overexposure to acute stress leads to symptoms of Acute Stress Disorder (ASD), (3) Cognitive and behavioral inhibition as natural effects of the acute stress response, and (4) the literature on maladaptive coping strategies and how they lead to chronic stress. Once the reader has an understanding of how and why stress occurs, we review the literature on techniques for stress regulation to enhance the approach of successfully regulating stress. Concluding with the limitations of these techniques in reference to long-term psychosocial adjustment in stressful environments, indicating a need for future research to review long term strategies for reducing the risk of “years-of-service” equating to “years-of-burnout.” Although most research done on stress indicates the benefits of cognitive reappraisal techniques in the short term, it does not pursue the long-term effects of stress reduction for psychosocial adjustment in work environments where stress is constant and expected.

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Introduction

Imagine a situation in which you are late for either work, school, or an event. You rush out the door, get on the highway, and try to beat the traffic. Navigating traffic can be... stressful. To arrive sooner you try veering into the left lane to get through traffic faster. You flick your blinker, quickly glance at your blind spot, and begin to make your move. As you enter the left lane another driver does the same. Except this driver cuts in with no blinker and without checking their blind spot. As they enter the left lane they slam on their breaks abruptly, causing you to do the same to avoid collision. Your seat belt tightens as you jut forward, coming to a full stop. What is the most common feeling someone can experience in a situation like this? You guessed it: Stress.

Stress is a pressure of tension exerted on a material object (in this case, a car). Stress is also a state of mental or emotional strain or tension resulting from adverse or very demanding circumstances (in this case, maneuvering traffic/avoiding collision). How we choose to experience these feelings in relation to stress depends on our emotional regulation. Emotional regulation is the way in which we attempt to influence emotions in ourselves and/or in others (McRae & Gross, 2020). Under this specific circumstance, emotion regulation may depend on whether you think the car, the person, or the situation itself is causing the stress. If we can't accurately identify where the source of stress comes from, we won't be able to use the psychological tools necessary for regulating that stress.

Two psychological measures have a strong correlation: Higher perceived stress is accompanied by higher negative mood (ElBarazi, 2022; Bartfai et al., 2021; Li et al., 2021). Stress management and emotional regulation are heavily dependent on factors of training/education in relation to what coping strategy is adopted (Sohail and Ahmad, 2021). This paper aims to provide clarity as to how stress is accurately identified, and the psychological tools with which to effectively reduce/minimize stress without adopting maladaptive coping behaviors.

In this thesis paper, the exploration of stress and stress management will consist of the following sections:

- 1) A brief overview of stress and its varying forms in relation to situations involving the stimulation of stress within a given environment.
- 2) A discussion of maladaptive coping strategies commonly used in reaction to stress, such as expressive suppression of emotional regulation, stress endurance, selective attention, catastrophizing, rumination, and other-blame.
- 3) A presentation of psychological tools for combating/coping with both physical and mental stress from a distance; i.e., not through physical exposure, but instead “mental exposure.” This involves cognitive reappraisal tools like, positive reframing, self-distancing, and temporal-distancing.
- 4) An assessment of the limitations of using these psychological tools to address situations that involve daily, repeated psychosocial stress, as opposed to events physical and mental stress exposure. This section includes case studies of psychosocial stress situations involving firefighters and nurses.

5) A discussion of additional ways of approaching psychosocial stress by reviewing the literature on cognitive empathy in connection with psychosocial adjustment over the long term.

1. Identifying the Stress Response

“If you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained you will also suffer a defeat. If you know neither the enemy nor yourself, you will succumb in every battle.” - Sun Tzu, The Art of War.

To regulate stress, we must first understand it. Stress refers to the defensive response of an organism in reaction to an external threat when exposed to specific stimuli (Wu et al., 2022). Ali et al. (2020) noted that stress is associated with an increased sensitivity to threat. To find out why that occurs and why it is a necessity for survival, Ali & colleagues performed a between-subjects study involving 161 healthy men and women. Participants provided threat assessments for both angry and neutral human faces on a baseline day, and then immediately after stress induction on testing day. Participants were separated into one of four pharmacological or placebo conditions: dexamethasone–placebo, placebo–propranolol, dexamethasone–propranolol, or placebo–placebo. The aim of this study was to systematically manipulate the biological stress systems during threat detection in order to investigate the interrelationships among them and the downstream effects on various facets that are involved in/impacted by stress.

When the “placebo–placebo” condition responded normally to stress on the baseline day, the threat assessment was higher for neutral faces as compared to angry faces. When the

sympathetic nervous system (SNS)—responsible for increasing heart rate and blood flow to distribute oxygen to the body in response to dangerous or stressful situations—was deliberately suppressed in the participants by using propranolol, it resulted in an increased threat assessment for angry faces. Suppression through use of dexamethasone of the Hypothalamus Pituitary Adrenal (HPA) Axis—which mediates the effects of stressors by regulating physiological processes such as metabolism, immune response, and the autonomic nervous system—resulted in decreased threat assessment for both angry and neutral faces. When both SNS and HPA were suppressed (dexamethasone–propranolol), there was an increase in threat assessment for angry faces, and no difference for neutral faces.

These results suggest the functional dysregulation of the stress systems have system specific effects on threat assessment. Increased threat assessment for neutral faces likely resulted from participants completing a threat-rating task immediately after stress induction, priming participants to experience neutral faces as threatening. This resulted in greater emotional reactions toward the neutral stimuli during the task. However, when the SNS is suppressed, the immediate stress response results in decreased threat assessment for neutral faces, supporting the role of the SNS in threat detection.

Such findings indicate the human biological systems adaptively support organisms in response to stress by focusing on specific stimuli relevant to the threat/situation (Ali et al., 2020; Tognoli et al., 2010). Dysregulation of the stress system results in false perceptions of threat evaluation. Suppression of either stress system (SNS or HPA) resulted in reduced threat assessment for relevant stimuli and when both systems are suppressed at the same time, they result in increased threat processing of both relevant and irrelevant stimuli.

Now that we know why both our body's SNS and HPA need to function properly for stress to accurately address stimuli in threatening situations, we need to understand what exactly that response is, and how it forms into detrimental effects of stress over time.

1.1 The Threat Detection Response

The Acute Stress (threat detection) response—a physiological response to intense/traumatic events, is activated to adaptively cope with the stress response—to which the SNS and HPA axis coordinate to respond to the stress accordingly. Meaning, the acute stress response is a necessary biological function for means of survival, regardless of the detrimental effects it causes with constant, repeated use. It is a stress response dependent on the type of novel stimuli experienced during a threatening event/situation. Overexposure of the acute stress response generates severe negative symptoms regarding mental health and emotional regulation (Worku et al., 2022).

According to Worku and colleagues (2022), that overexposure leads to Acute Stress Disorder (ASD)—a mental health problem occurring within the first month after acute stress responds to threatening stimuli—is the most common stress disorder and remains a main public health matter after exposure to physical trauma. To identify the associated effects of ASD, an institutional-based, cross-sectional design study was implemented among 422 trauma patients. Results indicated a previous history of trauma, past psychiatric illnesses, anxiety, poor or moderate social support, and moderate stress to life threatening events were significantly associated with ASD. Participants with anxiety symptoms demonstrated a 2.38 times higher risk of developing ASD compared to participants who did not have anxiety symptoms. Participants who had poor or moderate social support were 4.07 and 4.56 times more likely to develop acute

stress disorder compared to their counterparts. Not only does ASD indicate that stress increases based on the frequency and severity of the response, but it is also dependent on factors such as social support. When social support is not available, there must be an alternative means for regulating the stress response so as to avoid developing further symptoms of ASD. For this to occur, it's necessary to understand why ASD progresses. In the next section we will discuss the inhibitory responses that occur from threat detection and how they can lead into progressively worse symptoms of stress, like that of ASD.

1.2 Cognitive & Behavioral Inhibition

Within the activation of the acute stress response lie inhibitory responses used to shift a person's attention to the threat at hand (Wu et al., 2022). To test how acute stress affects these inhibition levels, Wu and colleagues (2022) invited 27 college students to participate in a within-subjects study first wearing an EEG and completing an SSAI, a short version of the State Anxiety Inventory (Donzuso et al., 2014). While still recording EEG data participants were split into two groups, one engaging in a "Trier Social Stress paradigm" (Kirschbaum et al., 1993) which involved deliberately inducing an evoked acute stress state period and the other a 15 minute reading period to set a neutral state in participants. Participants then completed a "two-choice oddball task" in the acute stress state (deviant stimulus) and the neutral state (standard stimulus), comparing reaction time, number of errors, and EEG data recorded the power of their alpha and theta frequency bands at the midline of the frontal lobe.

Participants demonstrated a shorter response inhibition time, a decreased number of response errors, and the EEG data showed a decrease in the alpha-band power values in the acute stress state, while theta-band power increased in the acute stress state. The alpha-band's purpose is to regulate sensory inhibition, attention modulation, and working memory, while the theta-

band is responsible for task related changes involving rhythmic and/or repetitive electrical activity generating both spontaneously and in response to stimuli.

To phrase it differently, this is an example of the switch that occurs when the threat detection response is activated. When stress adaptively reacts in response to an external threat, inhibitory control takes place, influencing working memory and cognitive flexibility. Inhibitory control functions to suppress the dominant response impulses, provide the basis for attention and decision-making, and aid in helping individuals achieve future goals by managing competing stimuli and inhibiting non-target stimuli, narrowing the focus down to the one object perceived to be responsible for the stress.

This may come across as confusing because of the detrimental nature of acute stress that was previously discussed, however there are two distinct factors that play a crucial role in the necessity of acute stress: Cognitive Inhibition and Behavioral Inhibition. Cognitive Inhibition refers to the inhibition of mental processes such as attention and memory in order to remove distracting stimuli and narrow focus to the task at hand (Wu et al., 2022). For example, needing to swerve out of the way of another car in order to avoid a deadly collision. A crucial tool for quick responsiveness in a threatening situation. Behavioral Inhibition, on the other hand, is the inhibition of external cue dominance or automatic responses in order to achieve correct reflection of the target only (Wu et al., 2022). In comparison to our fight, flight or freeze response, behavioral inhibition allows the individual to approach a threat with caution (Corr et al., 2013). Although there seems to be a significant negative correlation between the degree of stress and response time difference, it suggests that individuals who have sufficient cognitive resources can moderately increase tension. This increases the level of physiological arousal to help improve response inhibition; i.e., increased feelings of stress tension may improve inhibition response

time for threat detection. In other words, a higher level of tension from stress results in improved inhibition response time allowing for faster, more precise actions. Unfortunately, as will be discussed in the following section, this improvement is not sustainable over long and frequent repeats of tension.

2.3 When Stress Becomes Chronic

Chronic Stress, a prolonged, enduring feeling of psychophysiological activation in response to perceived threat or challenge, is associated with symptoms of fatigue, disturbed sleep and cognitive deficits, as well as an increased risk for adverse health outcomes across a range of medical disorders (Lindsäter et al. 2022). As opposed to the acute stress response, which involves a momentary spike in stress for threat detection purposes, chronic stress is a long-lasting effect caused by the psychological rumination on the events that previously triggered the threat detection response (Li et al. 2021).

Chronic stress also leads to the development of Stress Induced Exhaustion Disorder (SED), a byproduct of chronic stress. SED is a disorder characterized by severe fatigue, decreased tolerance to further stress, and lapses in memory and attention (Bartfai et al. 2021). SED in individuals demonstrated difficulty with selective attention, an ability to switch between automatic detection and controlled search, creating a need to compensate for SED impairments by adjusting performance to suit either speed or accuracy.

As we know from the previous discussion on the inhibitory controls for stress, they are meant to improve our response time by removing distracting stimuli and shifting our attention to the source of stress. If SED affects our selective attention, then inhibition response times are also affected as well (Cornelisse et al., 2011). To best prevent developing that level of selective

attention when faced with the future challenges of novel threat detection experiences, actions must be taken to redirect thought processes in order to be prepared for the prevention of chronic stress, and to be mindful of the acute stress response. It is often we develop maladaptive coping strategies as a means of regulating stress. The objective of the next section is to provide the reader with an in depth review of the literature on maladaptive coping strategies for regulating stress and explore what influences these strategies.

2. Maladaptive Coping Strategies for Stress Regulation

“The impact of stress on health and well-being is determined by the ability of an individual to cope with challenges imposed by the stressor” (Vasconcelos et al., 2021).

Maladaptive practices of simply “bearing and overcoming” stress still result in damage caused by oxidative stress, which increases the severity of things like Major Depressive Disorder, accelerated aging, and Alzheimer’s Disease (Miniksar & Göçmen (2022); Miller & Sadeh, (2014); Camporez et al., 2021).

People adopt all sorts of coping strategies for their stress. Macdonald and colleagues (1998) sought to find out what the most common maladaptive coping strategies for stress were among two groups, those with early psychosis and those without a psychotic diagnosis. Those with early psychosis were found to not cope as well as the group without a psychotic diagnosis. Within the early psychosis group existed three distinct coping strategies: distraction, internalizing, and seeking social support. While distraction and internalizing are maladaptive strategies, the seeking of social support is a healthy means of regulating stress, but is dependent on whether the social atmosphere benefits the regulation of psychosocial stress or influences the

dysregulation of it. In the following section, we will discuss different factors of maladaptive coping brought about by anxious symptomatology.

2.1 Coping with Distraction and Internalization

Distraction and Internalization are considered maladaptive coping strategies in the case of stress and lend themselves to poor performance (Shimazu & Schaufeli, 2007; Lehan et al., 2020). Often we try to avoid or ignore our feelings of stress by pursuing different mediums that bring us comfort, but don't solve the issue causing the stress. Thus, we distract ourselves from the source of the stress, only to find it exacerbates the symptoms more. Not addressing the stress will then lead to internalization of those feelings, causing the physiological arousal of stress through mere thought alone. In order to avoid falling into that pit leading to chronic stress, we need to find out what the trained mind can do to regulate stress.

In a study comparing measures of stress and coping between two groups, Sohail and Ahmad (2021) found that military personnel demonstrated higher levels of psychological well-being versus civilians who demonstrated Expressive Suppression of emotional regulation. Expressive Suppression is an emotion regulation strategy that consists of top-down, conscious control of reflexive behavioral expression of emotion (e.g., stifling laughter or crying, or maintaining a neutral facial expression to hide emotions). Any actions that seek to hide, inhibit or reduce the expressive emotional response to stress would also be considered expressive suppression (McRae & Gross, 2020). Demaray et al. (2022) indicates coping strategies that involve higher use of self-distraction and avoidance such as expressive suppression, are associated with higher levels of anxiety. As discussed earlier, behavioral inhibition is influenced by responses that incite expressive suppression, causing further development of anxiety through

avoidance. That type of inhibition allows us to cautiously approach the threat, but if the threat remains to be approached, the stress response remains (Andre & Wong Alex, 2022). This additionally demonstrates the importance of confronting the source rather than deliberately avoiding.

Rodriguez-Menchon et al. (2021) provided a mediation analysis on anxiety, which showed that children with anxious symptomatology use more maladaptive coping strategies than those without such symptomatology. Maladaptive coping strategies are a means of regulating anxiety when avoiding the adverse experience causing stress (Wolgast & Lundh, 2017; Owen et al., 2023). These maladaptive strategies may include: Catastrophizing (fixation on negative outcomes), Rumination (constant, repetitive thoughts on a problem or situation), and Other-Blame (projection of one's misfortunes in order to protect the ego). If we were to apply this to the traffic scenario from the introduction, it would look like this: 1) Catastrophizing - *"I almost collided with that car. That could've led to serious injuries and damage to my car."* 2) Rumination - *"What happens if I get in this situation again? I'd have to get my car repaired, best case scenario. I'd have to go to the hospital, worst case scenario, costing even more money."* 3) Other-Blame - *"It's their fault I almost hit them, they should be more aware of other cars around them."*

Unfortunately, even if we try to avoid stress, there are still situations we cannot avoid being confronted by on a daily basis. For example, the civilian populace has suffered from psychological, physiological, and psychosocial stress, particularly more so recently with the exposure of SARS-CoV-2 (Covid-19) pandemic. Everyone around the world with elevated anxiety levels due to fear of exposure and uncertainty of the future (Qi et al., 2021) Those

individuals with suspected risk of exposure to Covid-19, as opposed to those without, develop more difficulty with emotional regulation and post-traumatic stress disorder (PTSD). Adding to this, daily stressors such as family violence, unemployment, and living conditions (which were all impacted by the Covid-19 pandemic) play an important part in causing psychological distress (ElBarazi, A. 2022). There is no situation in which stress can be completely avoided, so there must be conscious action taken to regulate it properly. The following section will cover Cognitive Reappraisal and varying forms of Cognitive Reappraisal as a means for healthy regulation of stress.

3. Cognitive Reappraisal Tools for Stress Prevention

Cognitive Reappraisal is a form of cognitive change that involves construing a potentially emotion-eliciting situation in a way that changes its emotional impact (Gross et al., 2006). The term “Reappraisal” comes from the cognitive transformation of emotional experience. In order to transform that experience, we need to be able to apply this to a practical situation...

In the previous example, we might have used Catastrophizing by saying, *“I almost collided with that car. That could’ve led to serious injuries and damage to my car.”* Instead this time, we’ll apply the Cognitive Reappraisal technique to the same situation: *“I almost crashed into their rear bumper. However, no one got hurt and neither of our cars are damaged. Mistakes happen, they might be in as much of a rush as I am.”* Followed by the deliberate use of “Acceptance” of the situation. We do this by welcoming non-evaluative judgement by saying, *“I wonder why I got so upset about this situation.”* Thus, we elicit an emotion that does not seek to negatively project the event on either the self, the other driver involved, nor the situation itself. This prevents cultivating dysregulated stress levels through maladaptive use of previously

mentioned strategies (catastrophizing, rumination, and other-blame). Cognitive Reappraisal techniques have shown a significant positive increase in the engagement of positive psychological states, and provides the ability to better understand the point of view of the other person (Keil et al., 2022). For example, unaddressed psychosocial stress is Social Anxiety Disorder (SAD), which is characterized by both enhanced emotional reactivity and deficits in emotion regulation, involves an intense fear of negative evaluation, and can result in a significant reduction in the quality of life (Keil et al. 2022). If the threat detection response arises in a social situation, of which we value how our being is evaluated by others, it can be difficult to decipher how to use cognitive reappraisal strategies to cope with it. Being that this psychosocial dynamic requires approaching the stress in others and not just the self, the individual may be more susceptible to using maladaptive coping strategies in response (Idrees & Ahmad, 2022). This leads to further stress reactivity, which can occur through the physiological arousal of stress by thought alone. This reactivity results in blunted HPA reactivity, which as we know will cause decreased threat assessment. In effect, increased stress reactivity will deteriorate our ability to accurately assess threats, leading to higher levels of perceived stress in psychosocial environments (Duprey et al., 2020; Ali et al., 2020).

To understand SAD further, Keil and colleagues (2022) investigated differences in subjective and cortical responses in children with SAD, healthy controls (HC) and a clinical control group with a mixture of anxiety disorders (MAD) through means of two cognitive appraisal conditions: reactivity and reappraisal. The children participants in the reactivity condition were presented with four different photos of angry faces, and were instructed to appraise the stimulus as socially threatening. The reactivity response commonly being something

like, “Tom looks angry because he doesn’t like you.” In the reappraisal condition, another four photos of angry faces were presented, and the participants were instructed to reappraise the face in order to make it less socially threatening, for example, “Max looks angry because of a bad grade. This has nothing to do with you.” All children demonstrated reduced subjective reactivity following reappraisal and displayed positive effects on their subjective arousal, supporting evidence of cognitive reappraisal as a beneficial emotional regulation strategy for children already suffering from anxiety disorders.

What happens when we’re already struggling with maladaptive coping strategies and anxious symptomology? Perhaps instead you’re dealing with stress from the comfort and safety of your home. What tools are available for managing these symptoms from a distance in order to regulate anxiety? The next section will cover three tools of Cognitive Reappraisal for regulating anxiety symptoms.

3.1 Three Tools for Managing Stress

Ranney et al. (2017) presented an experimental study in which participants were randomly assigned to reflect on an interpersonal experience using one of the four conditions: a Positive Reframing condition, a Self-Distancing condition, a Temporal-Distancing condition, and one in which they would act as they normally would. The three conditions of Positive Reframing, Self-Distancing, and Temporal Distancing are varying forms of Cognitive Reappraisal, for which we can actively use to refrain from maladaptive strategies. Positive Reframing is a means of redirecting/changing the perceptual experience of a situation by placing it in another appropriate context, allowing alternative explanations to be proposed in order to view the self/situation in a more positive light. Self-Distancing is a means of visualizing the

stressful situation from a distance, and interpreting your emotions and the situation. Temporal-Distancing is a means of visualizing how this situation or event will affect you in the future.

The participants identified five stressful interpersonal events that they might face over the next few weeks and entered those stressful events into five implementation intentions in the following structure, “When [the stressful event generated by participant happens], later that day, I will use the [name of technique] by [instruction of how to use technique].”

One positive reframing participant thought they might have a disagreement with their boss in the near future, and used the structure example in the following way, “When I object to my boss’s demands, later that day, I will use the positive reframing technique by finding (a) the positives from the negative event, (b) the things I can learn from the negative event, and (c) the things I can do differently in the future because of what I’ve learned.” They used a concrete, reoccurring event in their life to view the situation in a more positive light, and find a positive investment to be gained out of that experience.

Another participant implemented the self-distancing technique using the same structure by saying, “When I get in a disagreement with a friend, later that day, I will use the self-distancing technique by visualizing the event as a fly on the wall and by using my own name while describing my emotions and what happened.” This technique provided the participant with the means to objectively view a reoccurring event that provokes a stress response and assess what emotions they experience.

A third participant implemented temporal distancing with the same structure, saying “When I have failed at something, later that day, I will use the temporal distancing technique by thinking about how my future self will view this event in a year from now, 5 years from now, and 10 years from now.” Using this technique, the participant was able to focus on the current

consequences of an event, and how those consequences would fade over time. They responded to their emotions as temporary experiences rather than as permanent or reoccurring, while providing focus towards how their perceptions of a particular event may change over time.

As a result, all three of these specific reappraisal techniques were highly effective at increasing well-being, decreasing ill-being, and decreasing negative emotional reactivity as compared to the control groups, and were similarly effective to each other. The study provided results from a mediation analysis indicating that these three reappraisal techniques may work by increasing global cognitive reappraisal for enhanced well-being.

As an example for stress management, one participant shared unsolicited feedback about their experience using temporal distancing saying, “I love this method as it releases me from unneeded stress and allows me to more perfectly live in the now. Weird how thinking about the future helps you live in the now.” Returning to the present moment through use of these tools avoids circumstances of rumination that influence further development of stress symptoms.

3.2 Applying these Tools to a Case Study

A case study by Neeleman (1992) in which a 30-year-old married designer was referred with anxiety which had failed to improve after consistent use of beta blockers. Beta Blockers, also known as beta-adrenergic blocking agents, are a type of medication used to reduce blood pressure in order to block the effects of adrenaline and cause the heart to beat at a slower pace, while widening veins and arteries in order to improve blood flow. This individual provided a two-year history of daily panic attacks, occurring especially when driving or using public transportation. Each attack lasted almost four hours and was often associated with avoidance. These symptoms had begun in the first few weeks after their second child was born. Dating back four years to the birth of their first child they, at the time, had suffered from “free-floating

anxiety” (meaning, anxiety not directed toward any specific situation or object) *without* the use of avoidance. Although the patient reported one attack a week and their anxiety with concomitant decreased in avoidance scores, there was a prediction of relapse due to a lack of understanding about when and why these attacks occur. 12 weeks later, the patient suffered less than one panic attack a week, and their avoidance scores had decreased as well.

There are a few insights to gather from this experience. 1) avoidance causes an exacerbation of symptoms. 2) approaching/confronting what is subjectively causing or providing these stress responses is a useful tool for being able to identify symptoms through concrete observation. However, there wasn't evidence, in this case, of elimination of symptoms.

Harking back to the study by Ranney et al. (2017) on the three cognitive reappraisal techniques, how can we approach this situation using each of those techniques? First we'll start with the structure, “When [the stressful event generated by participant happens], later that day, I will use the [name of technique] by [instruction of how to use technique].” Then apply this structure to the narrative of this case study.

To reframe this situation one might say, “When I drive or use public transportation, later that day, I will use the positive perspective technique by finding the positives from this negative event involving transportation, what I can learn from it, and what I can do differently in the future using what I've learned.

For self-distancing, “When I drive or use public transportation, later that day, I will use the self-distancing technique by visualizing this event and describing my emotions and what happened.” In the case study presented, this was done similarly through the use of journaling.

Finishing off with temporal distancing by saying, “When I drive or use public transportation, later that day, I will use the temporal distancing technique by thinking about how my future self will view the use of transportation in a year, or five years, or ten years down the road.”

By first being able to identify what is provoking the stress response, the individual is able to confront it not through physical exposure as a form of desensitization, but rather through psychological distancing using these cognitive reappraisal tools. These tools allow for a safer, more effective environment in which an individual can confront these stress provoking experiences by shifting them into a more positive perspective, all from the comfort of their own home.

However, there may be times where catastrophizing and rumination occur, and you are unable to identify the stress. Harking back to the study on Behavioral Inhibition, this may be due to the fact that there unresolved stress still lingers. The purpose of Behavioral Inhibition is to allow us to approach the threat with caution and address it, but if we fall into a pattern of expressive suppression as a coping mechanism, we avoid addressing the threat. Thus, if the threat is ignored, it will reproduce itself into anxiety leading to increased probability of developing acute stress disorder (Worku et al., 2022). Keep in mind, this is involving a scenario like the traffic example previously mentioned. What if, on a psychological and physiological level, we were no longer behind the wheel? Instead, perhaps the stress stems from psychosocial interactions with the people around you, of which you have less control over. As we learned in the previous discussion, Cognitive Reappraisal does aid in regulating stress on psychosocial levels as well. The following section will question how, as opposed to controlled settings, stress

regulation is affected on a daily basis and how that daily stress in everyday environments affects us in the long term.

4. Limitations of Cognitive Reappraisal for Psychosocial Stress

As we understand from the previous studies presented, in most situations involving exposure, the stress can be identified and then be readily handled using tools of cognitive reappraisal for stress reduction from either a distance or in the immediate occurrence of the threat detection response (Lee et al., 2020; Blise & Lou, 1995; Ranney et al., 2017). However, not all situations involving stress are avoidable. (Rusinova-Hristova et al., 2022; Demaray et al., 2022; Kagan et al., 2022; Rotenberg & Renhard, 2022). Can't call out of work everyday because you're experiencing stress, unfortunately. The solution to psychosocial stress differs due to the daily, repeated experience of stressful people, in stressful environments. How does one reduce the occurrence of stress reactivity in environment that are constantly stress producing?

4.1 Psychosocial Stress: Firefighters and Nurses

In environments that require a professional level of teamwork and trust, Firefighters are at the top of the list. When risking your own life while saving the lives of others, Firefighters require immense trust and reliability in their coworkers. Reliability, honesty, and emotional trust beliefs in coworkers are correlated with psychological well-being. These three factors play a role in the psychosocial adjustment, an individual's ability to adapt to a stressful environment, in relation to the years-of-service burnout involved over the course of being, "on the job" (Rotenberg & Renhard, 2022).

In a study involving 102 firefighters, participants completed measures of trust beliefs in co-workers (honesty, reliability and emotional) psychosocial adjustment, (stress, psychological well-being), and years of service (as an index of burn-out).

With that said, those three factors accounted for 22% of the variance of psychological well-being and 21% of the variance of stress, with reliability trust beliefs in co-workers accounting for 17% of that variance. Reliability and honesty resulted in a negative correlation with stress, which alludes to their positive use against a stressful work environment. To elaborate further, years-of-service for firefighters is associated with general measures of stress and lower levels of psychological well-being and negatively correlated with honesty trust beliefs in co-workers and psychological wellbeing.

This alludes to the notion that participating in stressful social environments accumulates stress over long periods of time, resulting in further consequences of stress. Psychosocial adjustment is then identified as a constant fundamental practice over the course of many years in order to limit exposure to stress responses. Meaning, there is no “one and done” event in this case, like the traffic example. This must be shaped over the course of years in order to adjust to the environment accordingly.

Nurses are no exception. During the first break out of Covid-19 there was an immediate rise in morbidity and hospitalizations. Physical and emotional stress brought about by not only the extra workload, but also the risk of caring for critically ill Covid-19 patients (Kagan et al., 2022). To test the extent to which stress played a role, a mixed-methods study was performed in intensive care units (ICU) at a large tertiary medical center in Israel, during February–May 2021. Two forms of data were collected 1) Qualitative data collected from focus groups attended by 15

senior managerial nurses, 2) a cross-sectional study among 100 staff nurses working in 5 ICU's, data collected using a structured questionnaire.

The qualitative data analysis revealed two themes: Challenges of the Covid 19 pandemic and positive aspects of the Covid 19 pandemic. Nurses reported high levels of burnout, emotional stress and uncertainty, with moderate levels of professional functioning. Staff nurses reported that the increased effort required to complete tasks due to stress, uncertainty, overload, exhaustion, and mental fatigue led to impairments of professional functioning and quality of care (Kagan et al., 2022). In response to these challenges, managerial nurses emphasized growth of personal leadership and role modeling in response to the challenges of Covid 19. This led to a positive increase in, hope.

This active ability to respond to psychosocial stress by taking the role of a leader or role model helps to incite better moral and a reduction of the impairments brought on by stress overload. This points to the idea that helping to regulate the stress of others in the same environment may help to regulate your own stress. In the next section we discuss research showing the different requirements for regulating stress in the self vs helping to regulate another person's stress. The key distinction to note in the following section, to make it clear, people who are stressed can become your source of stress. Having the ability to regulate their stress may in turn help regulate your own, mitigating the risk of years-of-burnout in the workplace.

4.2 Regulating the Self v.s. Regulating Others

As we now understand, psychosocial adjustment from both firefighters and nurses requires constant readjustment of approach to stress because of the unavoidable stress producing environments. Although Cognitive Reappraisal strategies have proven effective, it is unclear if

there is a significant difference among the social reactions of someone else's discomfort (Enríquez et al., 2017). Our ability to regulate stress through use of Cognitive Reappraisal has proven effective, as noted from the previous studies mentioned. How this extends to settings with which your stress is due to someone else's stress is less clear.

Guendelman and colleagues (2022) point out that although Emotional Regulation (ER) techniques such as Mindfulness-Based Interventions (MBIs) (which involve cognitive reappraisal and mindful-acceptance) can help reduce psychological stress, it is less clear if the effects generalize to everyday social situations, which are among the largest stress triggers.

To test for this, they conducted a neuroimaging-based Randomized Controlled Trial (RCT), comparing the effects of a two-month Mindfulness-Based Stress Reduction (MBSR) on both the self and on actively improving others' emotional regulation and their neuronal correlates and empathy measures. It was found that MBSR led to improved personal distress reduction through both cognitive reappraisal and acceptance only in self conditions, and not when actively regulating stress in others. This led to increased brain activation and neuroplasticity for regulating self (parietal cortex) and others (precuneus). Distant social generalization effects of MBSR on cognitive empathy and compassion could not be shown. When taken together, the study identified both cognitive reappraisal and acceptance as active ER mechanisms of MBSR and showed behavioral effects extend mainly to self and not to social settings. It is speculated that this could be due to the fact that regulating others in distress is more emotionally demanding than only regulating oneself. With an increasingly demanding job it is difficult to expend more energy on tasks such as these while juggling work responsibilities, it is far easier to settle for less energy expending methods. Telling the other person to accept distress seems to indicate that the

other should endure and hold that aversive emotion, which seems to make matters worse for the other person (Guendelman et al., 2022; Vasconcelos et al., 2021).

Social settings require a certain level of cognitive empathy and compassion in order to refrain from approaching social situations with heightened levels of stress reactivity. Although demonstrating cognitive empathy for other in distress requires more effort/energy, does it have detrimental effects or positive effects on stressful environment?

To test for this, Guendelman and colleagues (2022) ran an immediate follow up study using a newly developed functional Magnetic Resonance Imaging (fMRI) paradigm to investigate mechanisms of self and other emotion regulation via cognitive reappraisal while the subject and an interaction partner outside the scanner were facing the same distressing situation simultaneously. 62 subjects underwent a “Self-other emotion regulation paradigm (SORT)”, to which the interaction partner and subject did not know each other prior and were told they were going to do the same task together. The relationship between distress levels and individual differences in emotional and cognitive empathy were also assessed.

Subjects in the study completed a Multifaceted Empathy Test (MET), which is a validated behavioral task that dissociates cognitive and emotional empathy components, and is built upon naturalistic stimuli and requires the subject to deploy different functional facets of empathy. The MET is comprised on 40 pictures portraying one or more persons in emotional scenes (e.g., a child in the middle of a war). Half of the pictures correspond to positive emotions and the other half to negative emotions. To test for emotional empathy, subjects answered the question, “How much compassion do you feel for the person?” for the negative valenced pictures, followed by “How happy are you for the person?” for the positively valenced pictures.

For the cognitive empathy part of the study, subjects were asked to select the correct emotional state of the depicted person out of a set of four possible answers involving the question, “How does the person feel?” After completion of this task, participants were then required to alternate between emotional regulation of the self and the active emotional regulation of others while being exposed to aversive pictures. It is at the point that participants were asked to engage in cognitive reappraisal and mindful-acceptance as emotion regulation methods. Any emotional state at the start of this task was considered the baseline condition.

When engaging in social emotional regulation, personal distress was reduced in the observer at a similar rate as in self emotion regulation. The fMRI analyses revealed increased activation for other vs. self emotion regulation in the precuneus and the left temper-parietal junction, which are commonly engaged in social cognition. This activation was also associated with lower self-reported stress and decreased sympathetic autonomic activity. While regulating other, precuneus activation exhibited a distinctive functional connectivity profile with parietal emotion regulation regions.

This suggests that social emotional regulation provides a “give and receive” level of stress reduction, which would prove useful in workplace environments like Firefighting or Nursing. Provided that this is a novel study design, these results are exploratory and offer insight into the mechanisms of regulating stress for psychosocial adjustment.

Discussion and Future Research

Flash back! You’re stuck in traffic again. You’ve caught yourself ruminating and catastrophizing on almost nearly crashing into the rear end of another car. We can’t change how we may have responded in that moment, or what already occurred. What can change is how we

will consciously view that scenario now, and how we will approach events like this in the future. The question to be addressed is, what happened after the traffic incident? What if you arrived at work, school or an event and the psychosocial environment only further dysregulated your stress?

To reiterate, stress is a necessary function for human survival. We require the inhibitions brought about by acute stress to keep us from crashing our car. However, this natural ability provided by stress is often dysregulated due to over exposure and maladaptive coping strategies. Provided that the threat detection response is necessary on a biological level for purposes of survival (Ali et al., 2020; Tognoli et al., 2010), we now know that over exposure leads to symptoms of ASD (Worku et al., 2022). To which, if those symptoms are left unchecked, can lead to Chronic Stress Disorder and eventually lead to Stress Induced Exhaustion Disorder. Using maladaptive coping strategies to regulate stress such as Expressive Suppression, catastrophizing, ruminating, and other-blame, lead to detrimental consequences of increased dysregulation of stress (Macdonald et al., 1998; Demaray et al., 2022; Sohail and Ahmad, 2021). Although tools such as Cognitive Reappraisal and the varying forms of Cognitive Reappraisal (positive reframing, self-distancing, temporal distancing) can aid in stress regulation (Lee et al., 2020; Blise & Lou, 1995; Ranney et al., 2017), there's a particular difference in being exposed to stress on a psychosocial level and how we can actively approach it (Keil et al., 2022; Idrees & Ahmad, 2022). The daily work/school grind can be an environment full of stress, and unpredictable stress at that (Rotenberg & Renhard, 2022)

With that said, psychosocial adjustment is a long term process that could be regulated through regular practices of cognitive empathy among coworkers. In the case of the firefighters,

they were dependent on feelings of trust and reliance in their coworkers, to which cognitive empathy practices could benefit not only regulating stress daily, but also regulate other coworkers stress too. In turn this would reduce exposure to stress in the environment and create a healthy psychosocial adjustment that avoids “years-of-burnout.” To the same affect of patching a leaky pipe, if healthy regulation of stress is to occur without causing burn-out after years-of-service, constant patching is required.

Future research should approach adding affective, but simple practices of both cognitive reappraisal techniques and cognitive empathy in work/school environments to test for it’s use in stress regulation, in comparison to “years-of-service” for psychosocial adjustment. This is all to postulate the idea that stress regulation is not just an all for one (cognitive reappraisal), but a one for all (cognitive empathy) matter as well. This research would require years of active application of these tools for stress regulation in order to mitigate the dysregulation of stress.

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