An Integrationist, Meteorologist-oriented Perspective on Trauma and Mental Health Coping

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Abstract

Meteorologists are faced with a multitude of stressors in the course of their weather prediction work. There is widespread anecdotal evidence to suggest that these factors are associated with various traumatic stress outcomes among forecasters. Thus, this paper takes an integrationist perspective in discussing and theorizing about emotional processing and the occurrence of job-related traumas in the meteorological workplace. We utilize process-experiential views on emotion for our discussion of emotional processing and merge Adlerian Individual Psychology principles with those of Acceptance and Commitment Therapy to provide insight into mental health coping strategies which might be helpful to meteorologists.

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“Some days doing ‘the best we can’ may still fall short of what we would like to be able to do, but life isn’t perfect—on any front—and doing what we can with what we have is the most we should expect of ourselves or anyone else.” – Fred Rogers (1928-2003)

Meteorologists are increasingly concerned with mental health, as evidenced by discussions in publications (Bolton, Ault, Greenberg, & Baron-Cohen, 2018; Bolton & Ault, 2020; Bolton & DePodwin, 2019; Gilford, Moser, DePodwin, Moulton, & Watson, 2019), presentations at weather and other conferences, and in postings on social media. However, discourse has been primarily anecdotal, while psychological concepts related to trauma have been only loosely-defined. Thus, with meteorologists in mind and through the integration of multiple psychotherapeutic and more general psychological perspectives, this paper introduces concepts related to trauma and trauma processing in the meteorological workplace. We begin with an overview of trauma-related concepts and a discussion of the process-experiential/emotion-focused therapy (PE-EFT) perspective on emotional regulation and processing. Following this, we make use of PE-EFT perspectives in theorizing on stress and trauma in the meteorological workplace. Finally, we explore and provide insight into mental health coping strategies meteorologists might find helpful, through the lens of Acceptance and Commitment Therapy (ACT; pronounced like “act”) and Adlerian Individual Psychology.

Many meteorologist readers will have heard of post-traumatic stress disorder (PTSD), which occurs due to injury or severe psychological shock. Symptoms include the re-experiencing of the traumatic event through memory-based flashbacks, persistently negative thoughts and feelings and a distorted sense-of-self, and negative arousal (e.g., aggression, recklessness; American Psychiatric Association 2013). At the heart of *post*-traumatic stress, however, are *peri*-traumatic emotions. These are the primary feelings of intense fear, anxiety, stress, helplessness, confusion, and even horror that occur in the moments *surrounding*

traumatic events. Under the right conditions, they can lead to PTSD (Ai et al., 2011; Dewey & Schuldberg, 2013).

The effects of trauma in a person's life tend to be cumulative. For example, prior traumatic events such as violent crime, vehicular crashes, combat-related stress, and natural disasters can each exert a toll on the individual and tax her or his abilities to cope (Boisclair-Demarble, Fortin, D'Antono, & Guay, 2020; Brownlow, Zitnk, McLean, & Gehrmann, 2018). Experience multiple traumas and the impacts multiply/increase. Thus, although it may seem comparatively benign, the experience of forecasting or warning about a dangerous, high-impact weather event could lead to symptoms of trauma, especially if the forecaster has experienced trauma previously. A run of stormy days or an active hurricane season may create difficult stressors for a forecaster even if they do not give rise to acute stress disorder or PTSD (Schwartz et al., 2018). These may take the form of worry or anxiety about the forecast situation, feelings of guilt about prior forecasts, lower tolerance for frustration, and increased sensitivity to the somewhat ordinary stresses of working as a forecaster. The moments after high-impact weather events can also be traumatizing for meteorologists whether or not they provided critical forecasts, as they reflect on the events and assess possible damage sites. Widespread anecdotal evidence suggests high-impact weather events contribute to trauma in meteorologists. While peri-trauma processing and coping responses vary, PE theories suggest positive responses to traumatization can be elicited via an understanding of one's emotions and the contexts in which they materialize (Elliot & Greenberg, 2007; Greenberg, Rice, & Elliot, 1993; Greenberg, 2004).

Process-Experiential/Emotion-focused Perspectives

Types of Emotions and Emotion Regulation

Emotions are generally construed as multidimensional, embodied phenomena affecting one's subjective experiencing of the world, one's behavior, and one's physiology (see Gross, 2008, for an extensive review). The experiential aspect of emotion—what it is like to sense or “go through” some emotion—is closely tied, linguistically, with the sense of *feeling* an emotion, to the point that “emotion” and “feeling” are often interchanged in everyday discourse.

PE-EFT theories tend to consider four types of emotion: Primary adaptive or primary maladaptive, secondary, and instrumental (Hermann, Greenberg, & Auszra, 2014). We see a more meaningful interpretation comprising three main types and two subtypes: Primary (with maladaptive or adaptive subtypes), secondary, and instrumental. Primary emotions are a person's first, visceral affective response in any situation. They are produced when “a multitude of sensorimotor and representational processes is set in motion to preconsciously and automatically produce emotional responses and action tendencies that provide our sense of personal meaning and help anticipate future outcomes” (Hermann et al. 2014, p. 179). Because moment-to-moment, primary emotional responses are predicated on a person's interpretive assimilation of past experiences (Damasio, 1994; Greenberg & Pascual-Leone, 2001; also see Hermann et al., 2014), they may be either adaptive or maladaptive. That is, they are mental states which may push an individual toward outcomes that are either positive or negative.

Secondary emotions are reactive responses to the primary emotional response. For example, numbness may accompany grief or one may become depressed when angry. Finally, instrumental emotions are learned expressive behaviors employed to achieve a desired effect, to manipulate or influence other people (e.g., appearing angry to exert dominance or using “crocodile tears” to spark sympathy or feigning distress to elicit attention; Hermann et al.,

2014). Our subsequent theorizing on trauma-related emotionality in the meteorological workplace considers primary and secondary, but not instrumental, emotions.

Before we continue however, we need to underscore a crucial point: Although any degree of trauma exposure puts one at greater risk for future peri-traumatization or clinical PTSD, trauma is a normal psychological response to extreme events. Its manifestation does not mean one is weak, different, or somehow inadequate. It is, rather, the brain trying to make sense of the troubling event or trying to perceptually assimilate and re-assimilate the event. It can be likened to a computer restarting following a displayed error message.

Emotion regulation is a process by which people attempt to influence which emotions are activated and when and how these particular emotions are subsequently experienced and expressed (Gross, 2008; Gross & Thompson, 2007). It is essential to psychological well-being (Gross & Muñoz, 1995; Sheppes, Suri, & Gross, 2015) and crucial within interpersonal contexts (Zaki & Williams, 2013).

PE-EFT perspectives typically consider that secondary emotions (e.g., despair or hopelessness), and primary maladaptive emotions (e.g., the shame resulting from perceiving oneself as worthless; the anxiety resulting from, say, insecurity or panic) are those which need to be regulated (Greenberg, 2004). This is done by fostering emotional resilience strategies and tools, including identifying, labeling, allowing, tolerating, and establishing a “working distance” from, one’s emotions; increasing emotional positivity; reducing one’s vulnerability to negative emotionality; self-soothing and self-compassion; mindfulness and meditative breathing techniques; and cognitive distraction (Gilbert & Procter, 2006; Greenberg, 2004; Linehan, 1993). When we are mindful of and compassionate towards our painful emotional experiences, they become more tolerable. We can then begin to change them, by opening

ourselves up to and enacting positive emotional experiences which work to transform the maladaptive response over time (Bartsch, Vorderer, Mangold, & Viehoff, 2008; Davidson, 2000; Fredrickson, 2001; Fredrickson & Levenson, 1998; Greenberg, 2004; Halperin, Sharvit, & Gross, 2011; Izard, Stark, Trentacosta, & Schultz, 2008; Jazaieri, Morrison, Goldin, & Gross, 2015; Pascual-Leone, 2017; Rottenberg & Gross, 2007; Tirsch, 2012).

Emotional Processing in the Meteorological Workplace

How can we use these concepts to understand the processing of stress and trauma in the meteorological workplace, which includes an array of settings as diverse as but not limited to the U.S. National Weather Service (NWS), broadcast television stations, the military and aviation, and private sector companies and small businesses? What do they tell us about the nature of a meteorologist's *being* and experiencing of things and events in the heat of critical integrated decision support services? To begin answering these questions, let's consider both types of primary emotion, and their associated secondary responses, through a few examples.

First, a forecaster might feel grief upon learning of tornado-related fatalities. PE-EFT would conceptualize this as a positive and adaptive response, because it allows the individual to acknowledge sadness (the secondary response) and move on from an irrevocable loss (of life) outside of the meteorologist's control. However, a maladaptive response might be self-criticism for a missed warning which, rather than triggering desire for learning where one's analyses or assessments went wrong, lends itself to shame and diminished self-worth (the secondary responses). Another primary response might involve a sense of excitement—this could be either adaptive or maladaptive depending on the specific context of the situation and the experience level of the forecaster: It could be positive in that it helps focus the meteorologist; it could be negative in that it removes the meteorologist's focus from the here-

and-now urgency of the event and/or causes panic or confusion. Still others might involve, to give just one more maladaptive example, fear and associated, secondary panic which leads to later rumination when processing through and reflecting on the event. These outcomes might be affected by external forces, too. Critiques or support of the forecaster from inside her or his own agency, company, or even office workplace, and from the public and news media more generally, can also affect how the situational response is internalized by the meteorologist.

Note that these scenarios take on a much more nuanced role in the real world; these are only basic, hypothetical conceptualizations. The idea here is that the primary emotional response leads either to an ultimately positive or negative outcome. These responses may also be predicated in part on the meteorologist's dispositional locus of control; that is, whether one attributes events as being produced or controlled by factors external or internal to oneself (American Psychological Association, n. d.; Rotter, 1966). For example, an externalizing locus of control would be exhibited when a meteorologist who learns of tornado-related fatalities affirms for her or himself that all she or he can do is issue the forecast; she or he cannot go door-to-door and make people take shelter or otherwise heed the warning, therefore, it is outside of reasonable control. This same situation could be interpreted by a meteorologist with an internalizing locus of control as one in which she or he did not do enough operationally, did not go far enough in alerting personal acquaintances, and/or did not spend more time working with local emergency managers to adequately communicate the threat more broadly.

An important matter related to primary and secondary emotional experiencing and processing, which is concerned with a phenomenon that goes by a number of names—secondary traumatic stress, compassion fatigue, “helper’s burden,” vicarious traumatization—is the cost of caring. These terms all describe the ways in which people in helping professions, or

those who help more generally, can take on or indirectly accrue the emotional responses and traumas of others, as one might breathe in secondhand cigarette smoke (Figley & Ludick, 2017). When engaging with critical weather watches and warnings, when surveying hazard damage sites—be they straight-line wind, tornado, hurricane, or other—and in other situations dictated by their job roles, meteorologists feel the focused, action-oriented empathy that is compassion. Prolonged expressions of other-directed compassion, which involves primary-response deep sympathy and sorrow for others, combined with primary-response stress and a desire to alleviate others' suffering, can lead to *compassion stress*.

Compassion stress evolves because stress brings about a demand, a sense that some action is required (Figley & Ludick, 2017) and we humans often feel driven to help. For meteorologists, this helping typically occurs through weather forecasting. Compassion stress can be felt whether the need to help is real or imagined. Under the right conditions and combined with compassion fatigue—a form of mental weariness and exhaustion due to exertion and the stress of placing one's sustained attention on others' emotional and physical pain—can lead to traumatization and more formal PTSD. Some (e.g., Figley, 2013; Figley & Ludick, 2017) consider compassion fatigue to be a form of PTSD while others consider it a separate outcome (Papazoglou & Chopko, 2017; Stamm, 2002). They do indeed have similar symptoms; compassion fatigue, however, results from a traumatic event experienced indirectly—for meteorologists, through empathizing with the person on the receiving end of the weather warning or other forecast product. For comparison, consider the mother who focuses so intently on caring for her child(ren), but neglects her own well-being.

Although meteorologists appear psychologically stable in a relative sense (Bolton et al., 2018; Bolton & Ault, 2020), recent and ongoing discussion within the weather enterprise

shows they are not immune to these processes, which are separate from more generalized professional workplace burnout (Newell & MacNeil, 2010). That being said, all of this discussion, which might be rather abstract, begs the question of how one can cope with difficult emotions. Having put forth some theoretical ideas, we want to continue the discussion with a multidisciplinary, integrationist exploration of ways in which meteorologists dealing with different levels of emotional difficulty and/or stress might go about this endeavor.

Mental Health Coping

While psychological problems arise for many reasons and different psychotherapy modalities differentially interpret these causal mechanisms, cognitive flexibility—the ability to readily shift one’s focus from one manner of thinking to another—is a common feature across interventions. The basic idea in applying psychological flexibility is that the individual is choosing to shift problematic cognitive patterns for the betterment of well-being (Park, Chang, & You, 2015).

An individually-oriented approach to mental health coping draws on principles from Acceptance and Commitment Therapy. ACT’s premise is that human suffering is inevitable, that we will all eventually deal with varying degrees of frustration, stress, anxiety, and so forth, and that such difficulties become potentially negative due to a lack of psychological flexibility (Harris, 2019). Whereas other psychotherapeutic views, such as PE-EFT or more traditional cognitive behavioral therapies, seek to transform, challenge, or otherwise change emotions, ACT focuses instead on the training and honing of flexibility.

Imagine a river. Where other therapies try to change and/or shape the water’s flow, ACT helps one to swim with what the river is producing. This is done by implementing mindfulness techniques to enable the individual to better accept and cope with personal circumstances in a

values-guided manner which can bring about a meaningful existence. What does values-guided coping entail; how does mindful awareness increase flexibility; and how does one live meaningfully? To understand and begin to answer these questions, we can look at the “hexaflex” model which describes the six core processes of personal change in ACT: (1) Contact with the present moment; (2) defusion; (3) acceptance; (4) self-as-context; (5) values; and (6) committed action. The World Health Organization (WHO) recently commissioned an ACT-rooted guide to coping with generalized stressors and emotional difficulties (2020).

Mindful contact with the present moment revolves around paying flexible attention to one’s moment-to-moment psychological experiencing; narrowing, broadening, shifting, or sustaining our attention depending on what’s useful and necessary in the moment (Baer, 2003; Moore & Malinowski, 2009). Defusion, or cognitive defusion more formally, involves mindfully observing one’s thoughts in a way that acknowledges them for what they actually are—mere words or mental images—so that they can guide but not envelope us (Wells, 2005; see Bolton & DePodwin, 2019 for some simple mindfulness strategies). Mindful acceptance is about opening up oneself to unwanted inner experiences of thoughts, memories, drives and impulses, mental images, and sensations (Harris, 2019). Through acceptance and defusion, we allow our internal cognitive and emotional experiences to flow freely, making room for them and then letting them go; a popular analogy is that our internal mental states are like clouds and, through this accepting process, we watch them enter into and then leave our awareness without acting upon them. They simply *are*; we allow them just to *be*, and strive to remain self-compassionate towards them.

The fourth concept, self-as-context, simply refers to an “awareness-of-awareness” and the processes one uses in noticing present-moment mental states, while the concept of values

refers to one's beliefs, morals, and convictions with respect to the myriad matters of the world and how she or he wishes to act within it (Harris, 2019). Committed action involves taking effective actions—goal setting and initiation, problem solving, skills training, and so on—to foster and then put one's healthy, life-enhancing values into practice and strive to live them out even when they arouse difficult thoughts, feelings, and experiences (Wilson, Murrell, Hayes, Follette, & Linehan, 2004). We can summarize the most important of these processes into a more concise, three-component “tri-flex” model of psychological flexibility (Harris, 2019), where flexibility is the ability to be present,¹ to open ourselves to inner experiences,² and to do what matters to us in order to live a healthy and meaningful life.³ These concepts can be readily applied to the meteorological workplace when considering the NWS mandate to provide critical weather forecasts for the protection of life and property. ACT would interpret this mission statement as a goal which brings meaning to each meteorologist's life.

Even with these various frameworks, however, let's focus on how ACT fits into a forecasting scenario. Note that not every aspect of ACT need be present in a given situation or at the same instant in that situation. In fact, there may well be an ebb and flow of these attributes throughout the situation. Since the goal of protecting life and property is typically the meteorologist's meaning-making mechanism, in critical forecast situations ACT theory would concordantly see secondary traumatization and other stressors as barriers to meaning and well-being. ACT would state that in the potentially-anxious lead-up to a severe weather event; when faced with grief upon learning of fatalities; when the boom, boom, boom staccato blasts of a fast-paced weather event take hold and the meteorologist begins to feel

¹ Through mindful, present-moment awareness of one's environment, thoughts, feelings, and so on.

² By separating our thoughts and feelings through defusion, recognizing them not as absolute facts but as mere mental representations and potentially faulty perceptions.

³ By accessing our healthy values and taking committed action towards living our lives in accordance with these.

overwhelmed by all that is going on; when feelings of hopelessness or despair threaten; and so forth, she or he can initiate coping by stepping back from the moment and taking stock of present mental states.

Upon contacting the present moment in this way and then defusing from and accepting the current circumstance, the individual can make a choice to respond to that circumstance with whatever value best helps in the moment: Courage in the face of severe and dangerous storms, to overcome one's fear; a healthy amount of humility alongside an outpouring of self-directed compassion upon missing a forecast and feeling hard on oneself. For vicarious traumatization or grief, perhaps a mindful acknowledgement by the forecaster that she or he performed in that instant at as high a level as was possible, and a re-committing and re-connecting to the daily values that individual holds close. These are, again, nuanced situations in the real-world which may not be adequately captured by our hypothetical posits. However, self-directed compassion—being kind to oneself and recognizing that one can only do the best one can do, particularly—is paramount in all of these, and other, situations (Gilbert & Procter, 2006; Tirsch, 2012).

Consider this situation which author H. Michael Mogil actually experienced. Mogil arrived to work at the Dallas - Fort Worth, TX NWS office late one summer afternoon. No weather of consequence was underway and none was expected. Mogil got to work. First, he checked the radar and saw a few showers to the southwest of the office. He reviewed weather charts and data and started looking at forecast models. Moments later a local TV meteorologist called in to inquire whether the office was going to issue a severe thunderstorm warning. Mogil wanted to know why. The TV meteorologist said, “don't you see the storm on radar?”

Mogil replied, “No. There are just some showers southwest.” The TV meteorologist asked Mogil to go look out a north-facing window.

The fair weather cumulus that were present when Mogil arrived had transformed into a sky almost as dark as night itself. Mogil immediately raced back to the forecast desk, started the warning process, and told the TV meteorologist that a warning was forthcoming. The next four hours involved issuing warnings and statements on severe weather in coordination with TV broadcast meteorologists and the NWS’ Storm Prediction Center (then known as the National Severe Storms Forecast Center), activating the local area storm spotter network, and tracking down what went wrong with the NWS Fort Worth radar (which never showed the severe storm over the Dallas - Fort Worth metro). It turned out the radar had been struck by lightning days earlier and had erroneously passed various system checks; repair took several days from discovery of this malfunction.

Looking at this scenario from an ACT vantage point, we can see echoes of mindful awareness in Mogil’s moment-to-moment assessments of the situation. We can see how values and aims, such as courage and a resilient response, could have been applied. Rather than panic, or freeze upon learning of the office equipment malfunction, Mogil flexibly employed workaround solutions to enable a functional forecasting environment. To Mogil, there was no time to bemoan the situation or to wonder “why didn’t the previous shift catch this?” There was time only not to sway from the fast-paced, rapidly-evolving weather situation.

A more socially-oriented, but not ACT-incompatible,⁴ view on mental health coping is held by Individual Psychology, originated by Alfred Adler, in its promotion of one’s personal

⁴ It is through the living of a meaningful life, one of the core outcome targets of ACT, that a person can contribute to the world; this is why we hold that the Adlerian viewpoint is not wholly incompatible with ACT.

striving to belong with others, to contribute to wider society, and to seek a sense of completion in relation to others (Ansbacher & Ansbacher, 1956). In this viewpoint, the choice of a person to work as a meteorologist reflects the ways that she or he has sought to belong productively with others—to play an occupational role in society and foster what Adler termed social interest.

Thus, one of the ways that the meteorologist contributes or gives back to society is through the weather observations and forecasts that are made. But, what happens when the forecaster is in a high-stakes, high-impact forecast event and worries about making an inaccurate forecast? Adlerian psychologists would say that the healthy, psychologically-flexible choice is to do one's best, acknowledge that action, and move onward (rather than become paralyzed, or freeze). In other words, the Adlerian view involves a psychologically-flexible, forward-focused trauma-coping strategy entailing the choice to look and move beyond the traumatic experience rather than dwell on it (Bonanno, Pat-Horenczyk, & Noll, 2011; Park et al., 2015). We can separate Adlerian and ACT-based flexibility, however, with the analogy to put on one's oxygen mask before helping others. ACT's flexibility would have us help ourselves first; Adler's flexibility would have us help ourselves *by* helping others.

After an acutely stressful or potentially traumatizing weather forecast experience, how might meteorologists attempt to cope and to work in the aftermath? It is important to understand, first, that the stressful weather forecast event does not happen in isolation—instead, Adlerian theory would state that the forecaster experiences it as a succession of events that have occurred in the stream of her or his life and that have also shaped the style of life or, in other words, the individual's unique, unconscious tendency to respond to or avoid the main tasks of life. In Adler's view, these revolve around friendship, love, and work (Ansbacher &

Ansbacher, 1956). This means that prior experiences and each person's unique style of coping and meaning-making will affect the stress-related impact that the weather forecast event has upon the meteorologist. Traditional Individual Psychology maintains that the stressful forecast event is *apperceived*—that is, each meteorologist uniquely perceives both the event and the meanings it has based upon her or his unique style of life (Maniacci & Johnson-Megalski, 2013). The trauma of the event may interact with these factors to *shock* the forecaster and give rise to the symptoms of acute or post-traumatic stress.

Contemporary Individual Psychology approaches to trauma place more emphasis on the psychology and neuropsychology of trauma and seek ways to help the person move forward towards healing and restoration (Hjertaas, 2013). In addition to techniques such as eye movement desensitization and reprocessing (EMDR) and mindfulness training, Individual Psychology coping techniques also may encompass constructivist and narrative approaches (Linehan, 1993; Moore & Malinowski, 2009; Oberst & Stewart, 2003). Here, the stressful, traumatizing weather event represents a break in the person's narrative—the story they continually construct about their place in the world, at work, and in relationships (Neimeyer & Stewart, 1998). Finding ways to integrate the weather event into one's dominant life narrative goes beyond finding meaning in the event or obtaining an answer about *why* the event or forecast unfolded the way that it did. Instead, narrating the event helps one to find meaning in *being* her or himself during and after the extreme weather event.

Closing Thoughts

In summary, emotions and traumatic events can generally have positive and adaptive, or negative and maladaptive, outcomes. The ACT viewpoint is that carrying out the mission to protect life and property, via the provision of weather forecasts, becomes a driving force and a

life-goal for each meteorologist. By carrying out this mission in a mindful and values-committed manner, ACT would state, meteorologists can individually and collectively become healthier and create meaning in their lives and the world. Adlerian Individual Psychology responds to these factors with a socially-oriented and forward-focused trauma coping strategy. In the Adlerian view, one can cope by doing one's best and flexibly choosing to strive onward and not dwell on the traumatic experience or stressor.

We view an integration of these viewpoints as beneficial. ACT focuses on techniques to make one healthier at the intrapersonal level while Adlerian Individual Psychology sees self-healing as facilitated, in part, by interpersonal helping. Crucially, you cannot have one aspect without the other. The individual, in this case a meteorologist, must be healthy before she or he can help others, and ACT can help facilitate this outcome. The healthy individual can then foster social interest by helping others—and in turn will begin to fulfill the need, central to Adlerian psychotherapy, to belong in society. ACT and Adlerian views, then, are not incompatible; different aspects of the philosophy of each interact and reinforce the other. In conjunction with an experiential-processing-based understanding of emotionality and trauma in the meteorological workplace, we believe these concepts can go a long way in helping meteorologists cope with their moment-to-moment psychological experiences. We hope readers find this material beneficial and encourage further discussion, as well as debate, around these ideas.

References

- Ai, A. L., Plummer, C., Kanno, H., Heo, G., Appel, H. B., Simon, C. E., & Spigner, C. (2011). Positive traits versus previous trauma: Racially different correlates with PTSD symptoms among Hurricane Katrina-Rita volunteers. *Journal of Community Psychology*, 39(4), 402–420. <https://doi.org/10.1002/jcop.20442>
- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders: DSM-5*. American Psychiatric Association.
- American Psychological Association. (n. d.). APA dictionary of psychology: Locus of control. Retrieved July 18, 2020 from <https://dictionary.apa.org/locus-of-control>
- Ansbacher, H., & Ansbacher, R. (1956). *The Individual Psychology of Alfred Adler*. Basic Books.
- Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical overview. *Clinical Psychology: Science and Practice*, 10(2), 125–143. <https://doi.org/10.1093/clipsy/bpg015>
- Bartsch, A., Vorderer, P., Mangold, R., & Viehoff, R. (2008). Appraisal of emotions in media use: Toward a process model of meta-emotion and emotion regulation. *Media Psychology*, 11(1), 7–27. <https://doi.org/10.1080/15213260701813447>
- Boisclair-Demarble, J., Fortin, C., D'Antono, B., & Guay, S. (2020). Gender differences in the prediction of acute stress disorder from peritraumatic dissociation and distress among victims of violent crimes. *Journal of Interpersonal Violence*, 35(5/6), 1229–1250. <https://doi.org/10.1177/0886260517693000>

- Bolton, M. J., Ault, L. K., Greenberg, D. M., & Baron-Cohen, S. (2018). Exploring the human side of meteorology: A brief report on the psychology of meteorologists. *Journal of Operational Meteorology*, 6(3), 23–32. <https://doi.org/10.15191/nwajom.2018.0603>
- Bolton, M. J., & Ault, L. K. (2020). Weathering the storms: Workplace well-being, mental health, and the U.S. meteorologist. *International Journal of Undergraduate Research and Creative Activities*, 12(4), 1–13. <http://doi.org/10.7710/2168-0620.0293>
- Bolton, M. J., & DePodwin, R. A. (2019). “So what if I’m not OK?” A discussion on meteorologists’ emotional wellbeing and healthy coping mechanisms for weather professionals in the face of mental health challenges. *PsyArxiv*, preprint. <https://doi.org/10.31234/osf.io/zh2va>
- Bonanno, G. A., Pat-Horenczyk, R., & Noll, J. (2011). Coping flexibility and trauma: The Perceived Ability to Cope with Trauma (PACT) Scale. *Psychological Trauma: Theory, Research, Practice, and Policy*, 3(2), 117–129. <https://doi.org/10.1037/a0020921>
- Brownlow, J. A., Zitnik, G. A., McLean, C. P., & Gehrman, P. R. (2018). The influence of deployment stress and life stress on Post-Traumatic Stress Disorder (PTSD) diagnosis among military personnel. *Journal of Psychiatric Research*, 103, 26–32. <https://doi.org/j.jpsychires.2018.05.005>
- Damasio, A. R. (1994). *Descartes' error: Emotion, reason and the human brain*. Grosset/Putnam.
- Davidson, R. J. (2000). Affective style, psychopathology, and resilience: Brain mechanisms and plasticity. *American Psychologist*, 55(11), 1196–1214. <https://doi.org/10.1037/0003-066X.55.11.1196>

- Dewey, D., & Schuldberg, D. (2013). Criterion A, peritraumatic emotions, and posttraumatic stress disorder. *Traumatology*, 19(4), 323–328.
<https://doi.org/10.1177/1534765613496650>
- Elliot, R., & Greenberg, L. S. (2007). The essence of process-experiential/emotion-focused therapy. *American Journal of Psychotherapy*, 61(3), 241–254.
- Figley, C. R. (2013). *Compassion fatigue: Coping with secondary traumatic stress disorder in those who treat the traumatized*. Routledge.
- Figley, C. R., & Ludick, M. (2017). *Secondary traumatization and compassion fatigue*. In S. N. Gold (Ed.), *APA handbook of trauma psychology: Foundations in knowledge* (pp. 573–593). American Psychological Association. <https://doi.org/10.1037/0000019-029>
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56(3), 218–226. <https://doi.org/10.1037/0003-066X.56.3.218>
- Fredrickson, B. L., & Levenson, R. W. (1998). Positive emotions speed recovery from the cardiovascular sequelae of negative emotions. *Cognition and Emotion*, 12(2), 191–220.
<https://doi.org/10.1080/026999398379718>
- Gilbert, P., & Procter, S. (2006). Compassionate mind training for people with high shame and self-criticism: Overview and pilot study of a group therapy approach. *Clinical Psychology & Psychotherapy*, 13(6), 353–379. <https://doi.org/10.1002/cpp.507>
- Gilford, D., Moser, S., DePodwin, B., Moulton, R., & Watson, S. (2019). The emotional toll of climate change on science professionals. *EOS*, 100.
<https://doi.org/10.1029/2019eo137460>

- Greenberg, L. S. (2004). Emotion-focused therapy. *Clinical Psychology and Psychotherapy*, 11, 3–16.
- Greenberg, L. S., Rice, L. N., & Elliot, R. K. (1993). *Facilitating emotional change: The moment-by-moment process*. Guilford Press.
- Greenberg, L. S., & Pascual-Leone, J. (2001). A dialectical constructivist view of the creation of personal meaning. *Journal of Constructivist Psychology*, 14, 165–186.
<https://doi.org/10.1080/10720530151143539>
- Gross, J. J. (2008). Emotion regulation. In M. Lewis, J. M. Haviland-Jones, & L. F. Barrett (Eds.), *Handbook of emotions* (pp. 497–512). The Guilford Press.
- Gross, J. J., & Muñoz, R. F. (1995). Emotion regulation and mental health. *Clinical Psychology: Science and Practice*, 2(2), 151–164.
- Gross, J. J., & Thompson, R. A. (2007). Emotion regulation: Conceptual foundations. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 3–24). The Guilford Press.
- Halperin, E., Sharvit, K., & Gross, J. J. (2011). Emotion and emotion regulation in intergroup conflict: An appraisal-based framework. In D. Bar-Tal (Ed.), *Frontiers of social psychology. Intergroup conflicts and their resolution: A social psychological perspective* (pp. 83–103). Psychology Press.
- Harris, R. (2019). *ACT made simple. Second edition*. New Harbinger Publications, Inc.
- Hermann, I. R., Greenberg, L. S., & Auszra, L. (2014). Emotion categories and patterns of change in experiential therapy for depression. *Psychotherapy Research*, 26(2), 178–195.
<https://doi.org/10.1080/10503307.2014.958597>

- Hjertaas, T. (2013). Toward an Adlerian perspective on trauma. *Journal of Individual Psychology*, 69(3), 186–200.
- Izard, C., Stark, K., Trentacosta, C., & Schultz, D. (2008). Beyond emotion regulation: Emotion utilization and adaptive functioning. *Child Development Perspectives*, 2(3), 156–163.
<https://doi.org/10.1111/j.1750-8606.2008.00058.x>
- Jazaieri, H., Morrison, A. S., Goldin, P. R., & Gross, J. J. (2015). The role of emotion and emotion regulation in social anxiety disorder. *Current Psychiatry Reports*, 17.
<https://doi.org/10.1007/s11920-014-0531-3>
- Linehan, M. M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. Guilford Press.
- Maniacci, M., & Johnson-Migalski, L. (2013). Conceptualizing and treatment of trauma and self-destructive behavior: The Individual Psychology perspective. *Journal of Individual Psychology*, 69(3), 169–185.
- Moore, A., & Malinowski, P. (2009). Meditation, mindfulness and cognitive flexibility. *Consciousness and Cognition*, 18, 176–186.
- Neimeyer, R. A., & Stewart, A. E. (1998). Trauma, healing, and the narrative emplotment of loss. In C. Franklin & P. S. Nurius, *Constructivism in practice: Methods and challenges* (pp. 165-183). Families International.
- Newell, J. M., & MacNeil, G. A. (2010). Professional burnout, vicarious trauma, secondary traumatic stress, and compassion fatigue. *Best Practices in Mental Health*, 2(12), 57–68.
- Oberst, U., & Stewart, A. E. (2003). *Adlerian psychotherapy: An advanced approach to Individual Psychology*. Brunner/Routledge.

- Papazoglou, K., & Chopko, B. (2017). The role of moral suffering (moral distress and moral injury) in police compassion fatigue and PTSD: An unexplored topic. *Frontiers in Psychology*, 8. <https://doi.org/10.3389/fpsyg.2017.01999>
- Pascual-Leone, A. (2017). How clients “change emotion with emotion”: A programme of research on emotional processing. *Psychotherapy Research*, 28(2), 165–182. <https://doi.org/10.1080/10503307.2017.1349350>
- Park, M., Chang, E. R., & You, S. (2015). Protective role of coping flexibility in PTSD and depressive symptoms following trauma. *Personality and Individual Differences*, 82, 102–106. <https://doi.org/10.1016/j.paid.2015.03.007>
- Rottenberg, J., & Gross, J. J. (2007). Emotion and emotion regulation: A map for psychotherapy researchers. *Clinical Psychology: Science and Practice*, 14(4), 323–328.
- Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, 80(1), 1–28. <https://doi.org/10.1037/h0092976>
- Schwartz, R. M., Tuminello, S., Kerath, S. M., Rios, J., Lieberman-Cribbin, W., & Taioli, E. (2018). Preliminary assessment of Hurricane Harvey exposures and mental health impact. *International Journal of Environmental Research and Public Health*, 15(5). <https://doi.org/10.3390/ijerph15050974>
- Sheppes, G., Suri, G., & Gross, J. J. (2015). Emotion regulation and psychopathology. *Annual Review of Clinical Psychology*, 11(1), 379–405. <https://doi.org/10.1146/annurev-clinpsy-032814-112739>

- Stamm, B. H. (2002). Measuring compassion satisfaction as well as fatigue: Developmental history of the Compassion Satisfaction and Fatigue Test. In C. R. Figley (Ed.), *Psychosocial stress series, no. 24. Treating compassion fatigue* (p. 107–119). Brunner-Routledge.
- Tirch, D. D. (2012). *The compassionate-mind guide to overcoming anxiety: Using compassion-focused therapy to calm worry, panic, and fear*. New Harbinger Publications, Inc.
- Wells, A. (2005). Detached mindfulness in cognitive therapy: A metacognitive analysis and ten techniques. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 23(4), 337–355.
<https://doi.org/10.1007/s10942-005-0018-6>
- Wilson, K. G., Murrell, A. R., Hayes, B. T. I. S., Follette, V. M., & Linehan, M. (2004). Values-centered interventions: Setting a course for behavioral treatment. *Cell*, 662, 816-5189.
- World Health Organization. (2020). *Doing what matters in times of stress: An illustrated guide*. Retrieved from <https://www.who.int/publications/i/item/9789240003927>
- Zaki, J., & Williams, W. C. (2013). Interpersonal emotion regulation. *Emotion*, 13(5), 803–810.
<https://doi.org/10.1037/a0033839>