Early Trauma, Loneliness, the Indoctrinated Self, and the Need for Compassionate Empathy

Also by Thomas Arizmendi

Toward Precision Assessment and Psychotherapy

Understanding Individual Differences through Neurobiology, Genetics, and Epigenetics

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Cambridge Scholars Publishing

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This book first published 2024

Cambridge Scholars Publishing

Lady Stephenson Library, Newcastle upon Tyne, NE6 2PA, UK

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN (10): 1-5275-6512-2
ISBN (13): 978-1-5275-6512-8

For Emerson and her classmates – that they may be able to learn in an atmosphere emphasizing critical thinking, healthy skepticism, and creative pluralism.

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ACKNOWLEDGEMENTS

I would like to especially thank Janice Andreyko for her close edits and helpful suggestions that provided more precision and clarity to my work. I also would like to thank Cambridge Scholars Publishing for their helpful edits. Finally, I want to express my sincerest thanks and appreciation to all my patients – they have taught me much and have fine-tuned my emotional antennae, especially in the areas of loneliness and overall struggle.

INTRODUCTION

First and foremost, this book is not meant to imply a cause-and-effect relationship between early trauma and states of loneliness or indoctrination. There is no such equation simply because there is an unfathomable number of factors involved – some of which we are not yet even aware of in view of our fluid environment. What the book does aim to do is to highlight the notion that early trauma and resultant stress renders all of us increasingly vulnerable to loneliness, indoctrinated states, and many other potentially debilitating conditions as we live our lives. Trauma, in general, but particularly events occurring early in the developmental phase, can create or exacerbate unmet universal needs such as the need to belong, to feel recognized, to feel safe, secure and trusting of others, to feel connected and validated by our social environment as well as the critical need to feel understood. These needs have been constant driving factors related to vulnerability. They have prevailed over centuries in both humans and our primate ancestors.

One of the most important points of this book is that early trauma is not just the result of heinous events such as physical and/or sexual abuse. This myth is what many still believe. However, potential trauma-inducing events such as neglect and other transgressions occurring during early development can be even more devastating. In extreme forms, neglect involves a severing of a connection or attachment – a consequence that leaves the child or adolescent without a course, unanchored. It can induce deep states of shame, humiliation, and guilt accompanied by a daunting sense of low self-worth.

Depending on a person's *initial degree of vulnerability*, which is related to environmental sensitivity and his effectiveness in managing previous stressful experiences, early trauma can accelerate the emergence and maintenance of vulnerability and compromise one's ability to cope –

lowering his *critical stress level*.[1] In doing so, it creates unfulfilled needs that often trigger recurring episodes of loneliness which may then result in a chronic condition as the person moves from childhood through adolescence and into adulthood. In addition, because the need for certainty and to feel grounded is typically violated, the young emerging individual becomes a prime target for various indoctrination scenarios some of which are very subtle. The comfort afforded by authoritarian systems, adhering to rules or "recipes" as to how we should live and how to view the world around us, is extraordinarily difficult to resist for many trauma victims.

Another central theme of the book is the *ubiquitous nature of loneliness* and the infinite number of doctrines and indoctrinating behaviors pressing on us from our social surround - universally widespread at pandemic levels. In the process of researching the material for this book, I was particularly struck by two facts: first, the devastating and far-reaching tentacles of loneliness which has proven to be a risk factor for many physical diseases such as cognitive impairment, cardiovascular disease, immune malfunctions, sleep disturbance, and many others including overall mortality risk; second, the pervasive and powerful presence of doctrine in our society. Indoctrination programs, formal and informal, exist and present a quotidian challenge *for all of us.* They exist not just in religious contexts (as emphasized in this book) but also in our schools, in advertising messages, in politics, as well as in numerous professional training programs.[2] Indoctrination processes even invade scientific and academic organizations. As such, one of my motivations for writing this book was to sound an alert – to help the reader become aware that attempts to indoctrinate exist in *all* corners of our life experiences. No one is immune – regardless of socioeconomic status, culture, education level or geographic location. We must refrain, in the face of tempting "solutions" to our unmet needs, from grasping at singular and narrow perspectives.

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[1] Degree of vulnerability and critical stress level are two interrelated variables constituting key risk factors that help predict whether or not a person will be traumatized by an event.

[2] As this is being written, there is now constant pressure in many states on those responsible for school curricula and the content of school books to revise U.S. history by ignoring certain troublesome (shameful) periods in our past in an attempt to preserve the notion of "American exceptionalism". Further, various conspiracy theories designed to support the myth that this country was founded on Christian values and principles have proliferated throughout the internet and various forms of social media.

As a result, I suggest that there is an enormous need for compassionate empathy and the formation of venues such as peer groups where empathy can not only be emphasized but practiced in real time. Empathy groups would *not* be structured or adhere to a doctrine nor be totally defined by rules. The emphasis would be on the interactive processes between participants based on a compassionate desire to be helpful and to be helped through empathic *understanding*. In this way, many core psychological needs can be fulfilled over time without resorting to faith in a mythical figure (deity) – just human-to-human compassion.

A call for compassionate empathy is actually a rather unique approach to both avoiding or recovering from indoctrinated states and aiding in the process of finding a person's true self; in other words, countering the effects engendered by an authoritarian/fundamentalist system. Most approaches advocate for head-on "combat" with those who live within an authoritarian system – especially religious organizations. For example, their primary goal is often to convince the believer that there is no God (deity) which may, directly or indirectly, induce shame or humiliation. As we will see, many scholars, including Sigmund Freud, belittled the religious adherent. In my view, such direct approaches of oppositionality most often fail. Even deprogramming techniques have limited efficacy. What they often result in is a hardened, passionate rebuttal from the believer and further confidence that this outsider is merely a member of "them" in the "us vs. them" bifurcation of the world; that he or she has fallen prey to Satan or some other negative force. Instead, I believe we must strive to take the long road – to first discover and understand the believer's unmet needs. That is, we must strive to understand the basis of the person's vulnerability and then begin to communicate that understanding in a format that is meaningful. This is the critical notion behind empathy groups.

In the case of those who were raised in a loving religious atmosphere and who deny any significant unmet needs, an empathic connection will *experientially* challenge the notion that only God or some other faith-based unseen figure can provide comfort and fulfilling love despite what their caregivers might have taught them. As hope and trust in their fellow man deepens and becomes more reliable, they can gradually loosen their attachment to God and the theocratic system within which they had been immersed. Critical in this journey is the individual's realization that we are all flawed and clearly imperfect. However, a relationship based on empathy will always lead to reparations when inevitable failures occur and periods of repair will only serve to strengthen the bonds of the partnership.

They deepen our trust in one another and, in so doing, create a faith not in an unseen mythical figure but in someone who exists in the real world that we live in every day – someone who is discoverable through normal sensorial experience. The faith in this instance is not whether an unseen God figure actually exists but it is a faith in the efficacy of our efforts to build empathic bridges toward a deeper recognition and understanding of one another. In the long run, we are building confidence that the potentially detrimental effects of traumatic stress can be overcome or significantly mitigated and, by extension, the ensuing feelings of vulnerability will be experienced as temporary or manageable. Importantly, the prospect of death, the instigator of death anxiety and the subsequent creation of heaven where the faithful are rewarded and eternal good times are realized, becomes less of a daunting experience because one can experience, in real time, the positive relational impact she has had on others and the lasting "spiritual" presence she has forged. There is no need for an afterlife – just the acceptance and pleasure of creating a better life for herself and others on Earth.

The overarching point is that there is *no need for a mythical world* (note how this is different from a doctrinal belief that there is no mythical world). Rather a different kind of faith, faith in one another, is possible albeit the road is long and the effort must be continuous - no instant solutions. We must learn to find comfort in the process of trying to be empathically available for one another amidst the myriad attempts to distract and sabotage our efforts to do so. But isn't this the essence of one's life process? Isn't this what many would call the "good life" – the ongoing attempt to *find* the individuality and uniqueness of each person rather than agreeing to *arbitrarily shape* one another based on the external forces of some preordained system?

Since there is no actual equation that links early trauma to loneliness or vulnerability to indoctrination, the following chapters attempt to describe the nature of early traumatic stress as well as some of the critical variables (environmental and genetic) that result in varying degrees of vulnerability to these unhealthy states. Beginning with a brief history of how stress came to be conceptualized in the body, ensuing chapters focus on the pandemic of loneliness and its potential to damage various body organs and systems, the role of vulnerability, (viewed from the perspective of environmental sensitivity) as a critical mediating variable in the relationship of stress with loneliness and indoctrination, and the process of religious conversion as well as indoctrination including potential sequelae such as fundamentalism and violence.

Exiting any system centered on a doctrinal, authoritarian structure is typically challenging to say the least – especially if the person has been immersed in the system for a long period of time. For those who manage to escape, a chapter on the "aftermath" includes numerous testimonies illustrating how painful the process can be including but not limited to symptoms of anxiety, depression, a sense of being detached and lost, and often symptoms that mimic PTSD.

The penultimate chapter introduces the suggestion of compassionate empathy peer groups. The idea centers on the arduous process of forging empathic relationships with one another, essentially building faith in our fellow man – not in a hypothetical spiritual figure. Following this, I provide a summary of key notions from throughout the book and end with some final thoughts that may provide substance for further considerations. They stem from the research I have undertaken for this book and constitute a freedom of thought and perspective – encouraging the antidote to indoctrination, if you will.

Finally, I have included a section entitled "Exploring Further" at the end of most chapters. These elective sections contain an elaboration of certain topics in the main narrative that are not necessary for a basic understanding of the text but that offer more detail and substance for the reader who may wish to further pursue certain ideas of interest.

CHAPTER ONE

THE CONCEPT OF STRESS: A BRIEF HISTORY

On July 4, 1936, Americans celebrated Independence Day as had been the case annually for many, many years. What most did not realize was that another event, occurring that same day, would eventually give them, particularly scientists, physicians, and mental health workers, an additional reason to celebrate. On that day, a short article, less than a single page, was published in the prestigious journal, "Nature", and would become a time-honored template for stress research – both then and still to this day. Stress has become a well accepted foundational element of most if not all physical and mental disorders. The author of the article, a Hungarian endocrinologist named Hans Selye (actually Janos Hugo Bruno Selye) was just 29 years old at the time. The paper, entitled "A Syndrome produced [sic] by Diverse Nocuous Agents" (Selye, 1936), outlined the three stages of a syndrome that result from "acute specific nocuous agents" and that potentially damage an organism – in this case, experimental rats. The particularly damaging agent, whether it be cold, surgical injury, shock, drug intoxication or any other agent would result in this same syndrome. This notion of a non-specific response to any external "demand" was destined to become a critical controversy and serve as an impetus for future researchers in their attempts to explain how the human body reacts to various forms of stress but also how the stress response is individualized based on a myriad of factors. But before explaining Selye's ideas in more detail, we must turn the clock back several centuries to understand the key stress concepts that preceded him.

Our Great Ancestors

Early notions that eventually resulted in explorations regarding stress centered around ideas such as "harmony" and "balance" in the body. Ironically, it was probably Pythagoras (570-495 BC), a Greek philosopher known for his contributions as a mathematician, who first offered ideas about harmony in the body. He used this term to describe the balance in

life and in the entire universe. Shortly thereafter, Almacaeon of Croton, whose writings spanned the time period from approximately 500 to 450 BC, was also a Greek philosopher and writer of medical articles. He is responsible for giving birth to the notion of "isonomia" which was meant to describe the balance between opposite forces, those toward and against a state of harmony. In essence, he began the notion of opposing forces that lead to health and disease (Chrousos, 2012; Billman, 2020; Nicolaides, Kyratzi, Lamprokostopoulou, Chrousos, & Charmandari, 2015). Heraclitus (540-480 BC) declared that all organisms had the capability to withstand change as a constant element of life (Le Moal, 2007). Here we begin to see the seedlings of homeostasis – a concept which was codified many centuries later.

The fourth century BC saw a continuation and expansion of these ideas from both Hippocrates (460-375 BC) and Empedocles (495-435 BC). The former, known as the father of medicine, proposed that harmony was associated with health and disharmony with disease (Le Moal, 2007). Health was further defined as a balance of the four "humors" – blood, phlegm, black bile, and yellow bile which signified the heart, brain, liver, and spleen respectively (Nicolaides et al., 2015). Hippocrates viewed nature as the ultimate cure for disease. Still, in modern times, some healers subscribe to a similar notion that the body, in concert with nature, will ultimately heal itself. As a pre-Socratic philosopher, Empedocles' thinking was heavily influenced by Pythagoras. In a sense, he was a "jack of all trades" since he held the roles of priest, physician, mystic, orator, and poet (Stavros, 2014). His two most significant poems, "On Nature" and "Purification" were used as vehicles for summarizing much of his writings. Most importantly, Empedocles denied the simple concepts of birth and death. Instead, he proposed that four basic elements - earth, air, fire, and water, which he called "roots", were either connected and in interaction with one another (i.e., life) or separated. The latter state signaled decay and a gradual decline to death. The primary forces responsible for either of these two states were love and strife. Love, according to Empedocles, produced a harmonious state where objects and people were unified and people were driven by compassion and kindness while living in a highly cooperative union. Strife separated the cosmic roots and resulted in deterioration of the individual (or society) which necessarily resulted in death (Stavros, 2014).

Almost a century later, Epicurus (341-270 BC) was focused on the management of stress – in other words, a lack of harmony. He insisted that the ultimate goal of life, in general, was reaching a state he called

"ataraxia" where the individual was impermeable to the stressors surrounding it (Chrousos, 2012). This translates to the modern notion of "coping" where a person may attain internal harmony and balance which he called "eustatheia". As Chrousos (2012) explains, this term can be conceptualized as "eustasis" or a harmonious state that moves us closer to the modern notion of homeostasis.

The "Modern" Movement

As we now fast forward to the nineteenth and twentieth centuries, stress research became dominated by physiologists and endocrinologists – replacing the theoretical musings of philosophers from the ancient world. In essence, the focus shifted from the more abstract philosophy of a harmonious and balanced form of existence to a more detailed and nuanced focus on physical anatomy. For example, the French physiologist, Claude Bernard (1813-1878), began his research concentrating on the secretions of the pancreas and was subsequently able to verify that sugar was manufactured in the liver. Such an accomplishment sealed his reputation as a prominent scientist. Bernard turned his focus to the nervous system – how it communicates with external events and how it integrates various body tissues to establish the "internal environment" which became popularized in its French translation, le milieu intérieur (Cooper, 2008; Davies, 2016; Nicolaides et al., 2015; Billman, 2020; Johnson, Kamilaris, Chrousos, & Gold, 1992; Chrousos & Gold, 1992). He hypothesized three basic forms of life: a state of indifference characterized by a lack of chemical exchanges; an oscillating life that falls sway to the external forces (e.g., plants, invertebrates, and cold-blooded vertebrates); and the highest form – a life characterized by a constant internal environment. The latter condition constitutes what he saw as the prerequisite for a "free and independent life" or translated to the French "La fixité du milieu intérieur est la condition de la vie libre, independante" (Billman, 2020; Davies, 2016; Le Moal, 2007; Johnson et al., 1992). He proposed that this independent existence was possible and could be maintained because the organism was able to compensate for external forces that might threaten its stability (Cooper, 2008). In particular, Bernard recognized that body organisms operate not in a random way but in an integrated and coordinated manner that leads to a stable and reasonably constant body temperature and blood glucose concentration (Billman, 2020).

Bernard was successful in introducing the idea of a dynamic, compensatory organism which was capable of adjusting as needed to maintain the

constant internal environment that was critical for the free existence he emphasized. All these adjustments were assumed to be regulated by the nervous system. Thanks, in part, to his research and consequently his theories, we could now see the possibility of a stress system that was multifaceted with a coordinated and integrated but, nevertheless, complex machinery.

Following Bernard and bridging the nineteenth and twentieth centuries, two physiologists, John Haldane (1860-1936) and Lawrence Henderson (1878-1942) carried on the French physiologist's ideas but adopted different paths. According to Cooper (2008), Henderson converted the notions of stability and harmony to a physical chemistry platform. He emphasized the maintenance of neutrality in the cells via a balancing of acidity and alkalinity. Haldane's ideas mirrored those of Bernard with a slight modification. He prioritized the dynamic balance in the body between disruptive and reparative activities. Haldane clearly disagreed with Henderson's chemistry template maintaining that living organisms have more idiosyncrasies and nuances than can possibly be explained by a chemical model.

Both Haldane's and Henderson's work, heavily influenced by Bernard, served to stir the interests and passions of an American physiologist, Walter Cannon (1871-1945). Early in his career, Cannon focused on the digestive system but he later turned to the autonomic nervous system (ANS), and, in particular, the sympathetic nervous system (SNS). He focused on the hormones of the adrenal medulla – epinephrine (adrenaline) and norepinephrine (noradrenaline). The notion of fight and flight was derived from the emotions of anger and fear. Cannon saw these two states as means of survival.

When considering the idea of constancy in the body, Cannon first considered the term "equilibria" but rejected this because it was more appropriate for simplistic closed systems that could be described by chemistry. Instead, he coined the term "homeostasis" to describe a condition which varies in minor ways but is relatively constant. This is the contribution to physiology for which he is best known. In "Wisdom of the Body", Cannon (1967 edition) explained how this new term was meant to capture the complexity and the cooperative nature of the body's organs:

"The coördinated physiological processes which maintain most of the steady states in the organism are so complex and so peculiar to living beings – involving, as they may, the brain and nerves, the heart, lungs,

kidneys and spleen, all working coöperatively – that I have suggested a special designation for these states, *homeostasis* . . . It means a condition - a condition which may vary, but which is relatively constant" (p. 24).

He later described the four general features of this process: (1) it is an open system subject to "disturbing conditions"; (2) in this system a tendency toward change is automatically met by the mechanisms which resist change; (3) cooperating factors may act simultaneously or in succession; and (4) when an event shifts the state of balance it is reasonable to expect an opposing force (pp. 299-300).

One other critical proposal can be attributed to Cannon that is perhaps less appreciated than the concept of homeostasis but was, in my view, very relevant to future research. It opened the door to the consideration of individual differences in stress response. He called our attention to the notion of a *critical stress level* that would overwhelm a person's homeostatic system – causing failure and death. He went on to hypothesize that this critical stress level was different depending on the various conditions and possible extremes of everyday existence. The implication is that critical stress conditions vary not only within a person and his or her context but also from person to person. This represents an important insight on Cannon's part and is particularly relevant for considerations (e.g., differences in vulnerability) that I will discuss in later chapters.

In some respects, if you augment Cannon's attention on the emergency systems of the stress response mechanism and the concomitant focus on the adrenal medulla and the catecholamines (epinephrine and norepinephrine) with Selye's emphasis on the adrenal cortex (glucocorticoids) you essentially have the rough version of our current day conceptualization of the human stress response system. In other words, Cannon focused on our response to acute threat whereas Selye concentrated on the effects of chronic stressors (Levine, 2005).

In his 1936 publication mentioned earlier, Selye outlined what he labeled the "general adaptation syndrome" (G.A.S.). Three stages constitute this syndrome and Selye was very specific as to what they are and when they occur. In the first stage, occurring 6-48 hours after the initial damaging event, there is rapid decrease in the size of the thymus, spleen, lymph glands, and liver. This will be accompanied by symptoms such as loss of muscle tone, decrease in body temperature, digestive tract erosions, etc. The second stage is resistance. It transpires about 48 hours after the injury and there is adrenal enlargement as well as a cessation of certain pituitary

hormones such as the growth and gonadotropic hormones in favor of thyroid and adrenal hormones for emergency purposes. This leads to an accumulation of resistance and a normal state ensues if the injury is minimal. The third stage describes the condition of severe injury which is intense enough that the organism eventually loses its resistance (1 – 3 months after the initial triggering event) and the person reaches a state Selye described as "exhaustion". That is a state similar to the first stage which was generally known as the "alarm reaction" (Selye, 1936). In this model, the three stress indices are adrenal enlargement, immune tissue shrinkage, and intestinal ulcers.

Although Selye did not use the term "stress" in his original article, he did, in fact, name and define it decades later in his well-known treatise, "The Stress of Life" (1978). For him, stress was conceptualized as "the nonspecific response of the body to any demand" (pp. 1, 55, 74). He further explained that "Those changes which are specifically induced by only one or the other agent must first be rejected; if you then take what is left – that which is nonspecifically induced by many agents – you have unveiled the picture of stress itself. This picture is the G.A.S. Once this is established, you can recognize stress no matter where it turns up;" (p. 65). The terms "distress" and "eustress" were employed to differentiate between harmful and good stress (i.e., stress caused by positive circumstances) respectively even though the body responds with the same nonspecific response to either of these types of stress.

How did Selye, an articulate young scientist, arrive at the notion of a "nonspecific response"? In fact, the story is rather remarkable because it captures both a fortuitous set of events followed by a deliberate and carefully performed scientific inquiry – thanks to Selye's curious mindset. Picture the following - Selye is in the earliest phase of his career and is focused on the effects of a certain ovarian extract which had been the focus of several colleagues. But his clinical technique leaves something to be desired. In working with experimental rats, Selye is clumsy in his technique of injecting them – often missing the proper injection target, then dropping them and chasing them around the lab, often for hours. This went on for several months, according to Sapolsky's (2004) account. After finally capturing the rats, he would examine them and discovered that they displayed enlarged adrenals, gastrointestinal ulcers, and immune tissue shrinkage. This is where the young scientist displayed a cool scientific approach to what must have been an increasingly frustrating ordeal. He decided to inject another group of rats with a saline solution. Again, he dropped them unintentionally and chased them all around the lab only to

find out that, upon examination, they showed the same triad of symptoms. He astutely realized that these symptoms could, therefore, not be the result of the extract since the saline group (controls) manifested precisely the same picture. This led him to the hypothesis that the symptoms were due to the stress (trauma) he had imposed on them as a result of his clumsiness – the missed injections, dropping and chasing. These symptoms must have represented a response to a general set of stressors. He subsequently put rats under various stress conditions – cold, heat, forced exercise, and surgical procedures. Once again, virtually the identical picture appeared as with the previous stressors – adrenal enlargement, peptic ulcers, and shrinkage of immune tissue. What started out as misfortune and likely frustration for this novice researcher became the critical data that persuaded him in his formulation of the stress concept (Sapolsky, 2004, pp. 7-8).

One other idea that Selye emphasized is that a disorder/disease may not be attributable as much to the intensity of the external or damaging agent but to the individual's inability to muster an adaptive response – perhaps due to an insufficient response system.

This is a critical point since it foreshadows the notion of individual vulnerability and the variation from person-to-person of the stress response system. Also, it indirectly implies that even the less formidable agents (stressors) might result in a strained response due to a compromised (not perfect) system and, in some cases, lead to a breakdown resulting in disease. In essence, it points to the idea of an interaction between the intensity of the agent and the body's stress response capability. Degrees of individual vulnerability and their underlying mechanisms is a concept that will be a prominent focus in later essays when we look at the complex network of variables (e.g., early life adversity, genetic and epigenetic factors, personality factors) that can result in the compromise of a person's system.

Contemporary Concepts

Since the work of Selye and Cannon, scientists have proposed modifications centering on the two ideas of response specificity and the concept of homeostasis. With regard to the former, some have conceptualized our stress system as a regulatory mechanism whereby the body compares information received with a setpoint. These comparison mechanisms have been referred to as "homeostats" (Goldstein, 2003). They work like a household thermostat that has a set temperature and compares this with the

external room temperature. The system is activated when the disparity between these two calls for it. The response pattern, according to this homeostatic theory, is context-specific. For example, the sympathetic nervous system (SNS) is the primary responder to exercise and cold exposure whereas the hypothalamic-pituitary-adrenal system (HPA) and the adrenomedullary hormonal system (AHS) would be more active for cardiovascular problems or low glucose levels. However, in some cases, the adaptive response may be specific to the stressor while in others it is nonspecific (Chrousos & Gold, 1992). There is significant overlap between the HPA, the AHS and the SNS but the relative influence of each depends on the nature of the stressor (see Goldstein, 2003, Table 1). Further, we know that different neural mechanisms and paths of connectivity are utilized depending on the nature of the intruding stimuli (Levine, 2005). Several individual mediators, such as genetic and epigenetic variants, previous experiences (especially those in sensitive periods - prenatal, perinatal, and early infancy), and others will dictate the state of the individual at any moment and determine how he or she responds to various challenges. It is the current predisposition of the individual and the nature of the challenging event that interact to determine the adaptive or maladaptive response.

Cannon was careful to define homeostasis as being not a static condition but one that varies within a small range – he described it as "relatively constant". Even today, the concept is still misunderstood and underappreciated, according to Billman (2020). He insists that the term denotes "staying similar" rather than staying the same. Upon further elaboration, his idea is that homeostasis is a dynamic process that is capable of changing the body's internal system to meet the challenge of the external environment. This is accomplished via negative and positive feedback systems. The reactive response of the stress system to the event may result in an appropriate match where the response system can then return to its original state of equilibrium (eustasis). However, the attempted adaptation may be inadequate. For example, it may be excessive or it may linger and not turn off when the challenge has been resolved (cacostasis). In the optimal scenario, the response is not only appropriate but it may result in a more robust and stronger stress system (hyperstasis) capable of meeting challenges that would otherwise have been overwhelming (this is essentially the idea of increased resilience) (Chrousos, 2009, 2012). An excessive response does not necessarily result in cacostasis. In fact, it may not only be adaptive but could actually boost the response machinery – resulting in hyperstasis. This process of response

system augmentation was first conceptualized almost a century ago as "hormesis" (Davies, 2016).

In sum, the idea is that the human response system is capable of adjusting to meet the demands of specific challenges both from internal and external environments.

Moving forward, Bruce McEwen has popularized the notion of *allostasis* which was originally offered by Sterling and Eyer (1988) who defined it as "stability through change". The idea is that the stress response system is dynamic and can adopt new set points in meeting the demands of the external world. Allostasis reflects a more adaptive and longitudinal system than does homeostasis – one that takes into account the current needs of the individual in the context of his previous experiences that demanded change. Allostatic mediators encompass wider boundaries within the body than does homeostasis and they account for continuous change within a person's lifespan as he encounters not only catastrophic/traumatic events but also recurring quotidian events such as daily conflicts, developmental transitions (e.g., childhood to adolescence to the increasing demands of adulthood) and a myriad of potential losses. To be sure, allostasis and homeostasis are cooperative in practice in that the former's purpose is to keep the body in a state of equilibrium but within a new range (i.e., new setpoints) as the situation may dictate either in the immediate time frame or over time (McEwen, 1998; Arizmendi, 2019). McEwen and Stellar (1993) elaborated on the idea of allostasis, accounting for the *cumulative* wear and tear the body must tolerate over time due to the "repeated ups and downs of physiological response . . . and the impact of wear and tear on a number of organs and tissues" (p. 2094). He labeled this cumulative burden on the body as "*allostatic load"* (AL).[1] Probably the most common example of this is the increase in blood pressure over time due to repeated attempts to adapt to even common everyday stressors – a path that can predispose a person to disease (e.g., hypertension, cardiac abnormalities, etc.).

Although still somewhat controversial as to whether it is substantially different than homeostasis and that it can be confusing (see Arizmendi, 2019 pp. 82-83, for example), the concepts of allostasis and AL have

[1] It should be noted that Selye (1978) first considered defining stress as the rate of wear and tear within the body but ultimately rejected this definition in part because it could not be objectively measured (p. 65).

gained some steam in the last two decades and, overall, are considered a viable contemporary model explaining how the body's response system is adaptive but that a person pays a price for the repeated attempts to adjust to challenges – small and large (Davies, 2016; Le Moal, 2007). Currently, we now know that wear and tear (AL) can be *objectively* measured and this is one of its strengths as a scientific concept. (see **Exploring Further – A**).

In the latter half of the twentieth century, we have seen a broadening of what constitutes stressful events. The early pioneers mainly conceptualized stressors as more abstract, inanimate events that had discernible anatomical effects. Such things as cold or heat exposure as well as toxic events were seen as typical stressors. More recently, though, psychological variables have been posited as significant challenges for our stress response system. Jedryka-Góral and her colleagues (2002) noted that theorists began to study mechanisms of how one appraises a situation. In general, researchers began to embrace the idea that a person's *interpretation* of an event was critical and very individualistic – dependent on a myriad of internal variables related to personality traits, prior life experiences, and other factors. The transition in how we understand the relationship between a person and environmental stressors went from strictly a physiological model to a much more expansive one that also takes into account psychological factors and the surrounding social context – making the understanding of stress reactivity, on an individual basis, a much more complex ordeal.

So, What Is Stress?

Defining stress has presented enormous problems for decades – dating back at least to Selye. Such attempts have led even the most renowned scientists in the field to express their frustration. McEwen (2002) captures this when he declares that, "dealing with stress is like fighting the mythical hydra, which has a limitless ability to grow new heads to replace the ones Hercules cut off". Seymour Levine (1985), a highly regarded researcher who has been studying stress reactivity for decades, describes the task in a chapter entitled "A Definition of Stress?". He states,

> "My chapter defines the concept of stress. I am not certain whether one who undertakes this task either has an enormous ego, is immeasurably stupid, or is totally mad. Attempts at definitions of stress have bewildered many an illustrious scholar, . . . One of the major problems is that most of

> the definitions have dealt with outcomes, and therefore stress has been defined by either a behavioral or a physiological response" (p. 51).

He subsequently called the process a "futile exercise" (Levine, 2005).

One reason for the ambiguity and the concomitant sense of futility in crystallizing a definition of stress is the genesis of the word itself (McEwen, 2004). It is a holdover from an old mechanical engineering term that indicates a straining force – to put strain on a material that may result in eventual overload causing breakdown, distortion or loss of the material's integrity (Le Moal, 2007). For example, in aeronautics, it might indicate a "load" or pressure on an aircraft's wing or on a component of the propulsion system. What this does is to conflate stress and stressor, a state versus an event, and this leads to confusion.[2]

So, to begin, we need to separate three distinct components. Stress itself is a state which we will define below, a stressor is the disturbing force that may be internal or external to the body. The stress response is the body's counteracting force (response) designed to neutralize the effects of the stressor and return the body to some degree of homeostasis or equilibrium (Johnson, Kamilaris, Chrousos, & Gold, 1992; Chrousos, 2012). In the most recent literature, the definition of stress has been updated to include a real or *perceived* threat to a state of equilibrium or homeostasis (Nicolaides, Kyratzi, Lamprokostopoulou, Chrousos, & Charmandari, 2015; Johnson et al., 1992; Chrousos, 2009; Chrousos, 2012; Goldstein, 2003; Cohen, Janicki-Deverts, & Miller, 2007). In my view, stress must be defined in the broadest of terms. The reason for this is that when we talk about a stress burden or load, even the smallest, undetectable, and seemingly inconsequential disturbances must be taken into account because they can have a cumulative effect. For example, in certain cases, we notice that some people report low-grade conditions of depression or anxiety but cannot point to even the smallest or most benign triggers. On a conscious level, stressful experiences can be literally undetectable in the moment and rather insidious. Nonetheless, they can affect our sense of well-being in a manner that is ineffable. Therefore, I understand stress to be *an experience of disturbance, conscious or unconscious, that is recorded in the body*. It results from a perpetrating force, the stressor, that alters or is anticipated to alter an existing state of balance, harmony or

[2] The term "stress" derives from a verb from the Indo-European culture indicating "to strangle" (Nicolaides et al., 2015).

equilibrium – a state of homeostasis. This disturbance may precipitate a positive or negative experience. Stress, itself, is simply a disturbing experience which, when conscious, is then assigned an emotional or cognitive valence by the individual – fear, anger, confusion, excitement, joy, anxiety, or even an ambiguous, undefinable state (e.g., caused by a sense of helplessness, feeling out of control, uncertainty), etc. The intensity of the experience is defined by the body's reaction and is typically recorded by expressions from the individual's organs, whether it be the cardiovascular system, the immune system, the gastrointestinal system, etc. A person's response may be adaptive, successfully answering the challenge and restoring a steady state or, in some cases, partially adaptive, or completely maladaptive. A maladaptive response may be inadequate in the moment, one that fails to alleviate the effects of the stressor, or it may be unnecessarily excessive, or prolonged (Chrousos, 2009). The response may protect us from potential damage - relieving the experience of stress and perhaps rescuing the individual from danger or it may actually cause damage in the case where it is prolonged and becomes chronic (McEwen, 2002). Defining stress in this way may give the impression that potential stressors are rather ubiquitous even in our everyday existence – and they are.

It should be added that some authors are critical of defining stress as simply a threat to a homeostatic condition, maintaining that this is too broad and essentially loses all meaning - sacrificing explanatory power. Instead, they advocate for a far more restrictive definition limited to conditions of predictability and control (Koolhaas, Bartolomucci, Buwalda, de Boer. Flugge, Korte et al., 2011). I would argue that this is too narrow. More importantly, the authors' argument against the more common definition of stress, the one that states that "virtually all activities of an organism directly or indirectly concern the defense of homeostasis" (p. 1292) actually points to a critical issue – that stress is ubiquitous! It results not just from what we would see as traumatic, horrific events that provoke a state of catastrophe, destruction, or emergency but also from everyday life stressors such as conflicts that are normal, built-in aspects of interpersonal relationships be they marital relationships, friendships, parent-child relationships, discord between colleagues, and so many more. As Sapolsky (2004) astutely observed, these constant everyday events are transformed into threatening challenges due to the automatic implementation of our marvelous frontal and prefrontal neural machinery (i.e., the superimposition of obsessive thoughts and imaginative creations onto straightforward and rather simple events). Our attempt to counteract them requires a prolonged activation of our stress system. Sapolsky maintains

that such prolonged responses are a primary cause of disease. We deploy a stress response system designed to resolve acute circumscribed situations (fight/flight/freeze) and, instead, we use it in an attempt to resolve ongoing continuous conflicts whose intensity we have amplified many times over resulting in cognitive and emotional threats to our well-being.

Acute Stress versus Chronic Stress

Put quite simply, acute stress is short-term stress where an event challenges us and is generally resolved within minutes or hours by our stress response system. A common example would be when we encounter a potentially dangerous situation which we are able to resolve or enlist the help of someone who can and the actual danger no longer exists (once again, though, a person may prolong the effects of the stressor and thus keep the stress response system online by imagining what could have happened, what might have been the result if the attempted resolution had been ineffective, etc.). Chronic stress triggers our stress response system over long periods of time – days, weeks, months, or longer (Jedryka-Góral, Maslinski, Ziolkowska, Kornarska, & Zolnierczyk-Zreda, 2002; Maté, 2003). As mentioned above, the human stress response system is designed to resolve stressors quickly, returning the body to its steady state – i.e., to previous levels of homeostasis. It is *not* designed for long-term stress activation wherein the continuous secretion of hormones, especially cortisol, can result in physical and behavioral damage. For example, chronic stress may lead to anxiety, depression, cognitive impairment, cardiac and metabolic disorders such as hypertension, obesity, type II diabetes, etc. Research has shown that chronic stressors are more associated with depression than acute stressors in several life situations such as physical illness, financial challenges, interpersonal conflicts, and loss due to the death of a loved one, for example (McGonagle & Kessler, 1990). Over long periods, chronic stress can result in changed set points of the stress response system which lead to the illnesses mentioned above – most commonly hypertension, obesity, and compromises of immune function. As Sapolsky (2004) explains, the issue is that prolonged stress response becomes the major perpetrator rather than the external stressor itself – ironically, the stress response, which is designed to promote survival, becomes the damaging agent. We often get “stressed out” in anticipation of a possible event and its consequences. The source of our cognitive power (e.g., the prefrontal cortex) can turn into the adversary.

A Personal Example

Here I would like to provide an example from my own experience that illustrates how a single event can become a chronic stressor. Early in my clinical psychology internship, I was asked to prepare an extensive clinical case presentation that was to be delivered to an audience of faculty members, fellow interns, and psychiatry residents. The night before I got virtually no sleep even though I had prepared extensively and had copious notes. I knew who would be in attendance and I tried to anticipate the questions and challenges I would get from each faculty member and from my colleagues (of course, the anticipated faculty remarks were uppermost in my mind, as one could imagine). As I went through the presentation earlier that day and all through the night, I rehearsed the possible responses I would give to these imagined questions. I was fearful of being "attacked" about certain aspects of the case and how I had handled certain situations during the course of treatment. Certain professors were a bit short on empathy, in my view, and their main interest would be how closely I followed psychoanalytic technique. For example, I had been told in several of my supervision sessions that I should not ask questions of the patient but only make declarative statements. Unfortunately, my innate curiosity had led me to ask a number of questions and I now was getting very anxious as to how that would be received. Then I began to obsess as to how I could avoid revealing these questions in the presentation - but this seemed dishonest so, after much consternation, I decided to just give my own, true version and "let the chips fall where they may". Still, a sense of inadequacy swept over me as I thought of different interventions I could have made that would have been more precise and pithy – another prized analytic style preferred by several of my supervisors. The faculty consisted of several psychoanalytic clinicians who were well known in the San Francisco clinical community. Many had published widely. I "knew" they would be scrutinizing every detail of my actions with the patient. At times, I got up to write notes – reminders of what to say in certain situations. Periodically glancing at the clock, I realized I had been obsessing for hours and had little time left before I had to get up and begin my day. Luckily, the presentation was scheduled for the first hour in the morning so I didn't have to fight the "demons" all day.

Although the presentation went well, I was still leery of future presentations. There were two or three professors who would be ready to pounce whenever I faltered in my technique. I had created "predators". My stress response system had taken a significant hit from the fact that the response (my preparation for the presentation) had become a lingering

obsession. In terms of allostatic load, these situations represent significant contributors to the cumulative wear and tear that build over a lifetime. The "stress burden" is lodged in the body via implicit memory. Such things as exercise and diet will help mitigate the effects but they do not erase it. In this case, even though I had prepared extensively, the anticipation and fantasy scenarios I had created turned what should have been a potentially acute stressor (the one-hour presentation) into a chronic stressor. The elaborate stress response became the damaging factor. In Sapolsky's (2004) comparison of human stress response tendencies versus that of the zebra, the latter would have spotted the predator (faculty and fellow trainees), enacted a fight or flight response (it would have been difficult to flee the situation), and either have succumbed or defeated the challenger – in the second case, he would have moved on without all the anticipatory or post hoc obsessiveness.

This example is certainly not a unique one, for sure. Millions of people in numerous contexts have experienced similar experiences varying only due to such factors as personality style, previous and current support systems, and so on. Many examples come from those in professional settings but others are created by individuals experiencing everyday situations, as Sapolsky (2004) describes. When we are in the midst of it, many of us are aware that this chronic stress is not good for our health. Yet we cannot stop because the societal rewards and recognition for accomplishment are so significant, so alluring. When we receive an award or a glowing evaluation, as I did at the end of my training, no one asks, "What price did you pay to attain that?" It seems we have built a world that is far more complex than that of the zebra and we pay a dear price for our stress response "negotiations" over the course of a lifetime.

Let's return to Selye one more time since the example just outlined has to do with the stress response system in the context of an anticipated event involving the psychoanalytic treatment of a patient. The accomplishments of Selye and Sigmund Freud have something in common in terms of how they have been viewed retrospectively.

Selye's findings and theories such as the idea of a nonspecific response were subject to corrections as further research enlightened us. In the case of Freud, many of his central tenets for psychoanalytic theory and technique, for example his ideas regarding the analyst's neutrality, the seduction theory, and his elaborate dream theory, have not stood up over time. They have been replaced by a more relational framework brought forward primarily by Stephen Mitchell (Greenberg & Mitchell, 1983) and

followed by several others. However, what is important to remember about these two brilliant contributors, Selye and Freud, is that they laid the foundations that spurred a cascade of advancements in their respective fields. Both have made critical contributions to our ideas as they exist today. Further, both are quite interconnected in a certain important way. Psychological treatment, especially in-depth analysis, is about the exploration of early stressors (e.g., familial conflicts, early trauma, etc.) and how, unfortunately, humans manage to frequently respond to acute stressors, for which we are generally well-equipped, with chronic maladaptive responses that often become the underlying mechanisms for disease.

Summary

Early pioneers, such as Pythagoras and Heraclitus, offered preliminary notions of what was later called stress. They described states of "harmony" and "balance" and posited that the human body could tolerate change. Hippocrates found that disharmony was associated with disease and, with his contribution, we moved closer to an eventual focus on how stress underlies disease. Cannon introduced us to the notion of "homeostasis" (constancy) and the idea of a "critical stress level" – the threshold for potential failure and death. Hans Selye is credited with major contributions that furthered our understanding by outlining the three stages of the "general adaptation syndrome" and later advanced the field in his treatise entitled "The Stress of Life". He viewed stress as the body's nonspecific response to any demand.

These ideas laid the foundation for our contemporary concepts of stress, despite the continued conflicts as to how it should be defined (primarily the confusion between the experience of stress versus the stressor itself and the body's stress response). McEwen (1998) popularized and advanced a more comprehensive and dynamic approach to the conceptualization of stress (allostasis) and laid out a system for measuring the stress burden on the body (allostatic load). Importantly, this allowed us to measure the longitudinal effects of stress over the lifespan – critical especially for conditions in the elderly.

Finally, acute stress and chronic stress are differentiated. The human stress response system is designed, in many instances, to negotiate the former but not the latter. An example is provided as to how we actually create the damaging state of chronic stress in our responses to everyday challenges.