The Physiologic Stress Response During Mediation

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I. INTRODUCTION

Conflict is ubiquitous in every type of mediation. Commercial mediators assist in contentious business transactions and help resolve litigated disputes, family mediators help divorcing couples work out parenting agreements as well as property settlements, environmental mediators bring together multiple opposing stakeholders to remediate air and water pollution, and community mediators work out small claims and neighbor disputes. Mediators are called in to facilitate negotiations because the parties, with or without attorney representation, are unable to resolve their conflict. Scientists have studied people in conflict, elucidating the interplay of the brain with hormones and psychology. This paper integrates these scientific findings with the practice of mediation.

The authors combine the expertise of a neuroscientist with the experience of a commercial mediator. We have merged our different perspectives to look at the neuroscience of conflict and stress as a tool that can help inform mediators. In some cases, this will reinforce existing practices and in other cases it will suggest new ideas related to the design of mediation sessions.

Mediators, like professionals in many other fields, have become intrigued with neuroscience and have explored the neuroscience literature trying to glean principles to apply to mediation.[1] They hope that advances in neuroscience will provide insight into how to interpret the behaviors they see in the parties to mediation and guide their interventions. Neuroscience can contribute to this goal only if there is a clear focus on particular aspects of the mediation process. Here we focus on conflict and the stress that it triggers. Moreover, neuroscience must be conceptualized broadly to include (1) the hormones that coordinate the brain, body, and behavior, and (2) a neuroethological perspective that considers why similar neural and hormonal mechanisms would have evolved to subserve conflict among diverse vertebrate species, including humans. With this approach, insights can help confirm why some traditional mediation practices are effective, why others are not, and suggest new ways to help parties resolve their conflict more effectively.

This paper will focus specifically on the physiological stress response, which is an inherent part of conflict, and detail its impact on the mind and

[1] *See, e.g.*, Richard Birke, *Neuroscience and Settlement: An Examination of Scientific Innovations and Practical Applications*, 25 OHIO ST. J. DISP. RESOL. 477 (2010). *See generally* David Hoffman & Richard Wolman, *The Psychology of Mediation*, 14 CARDOZO J. CONFL. RESOL. 759 (2013); Jeremy Lack & Francois Bogecz, *The Neurophysiology of ADR and Process Design: A New Approach to Conflict Prevention and Resolution*, 14 CARDOZO J. CONFL. RESOL. 33 (2012).

body. The stress response evolved over millions of years and in a variety of animals including humans. We will identify what triggers stress in humans, particularly during mediation, and the hormonal cascade that unfolds when stress is triggered. We will then focus on the effects of the stress hormone, cortisol, on the complex cognitive and emotional tasks that must be accomplished in an effective mediation. Throughout, we suggest concrete, practical steps that can minimize the stress response and maximize the opportunity for decision-making unclouded by an overdose of stress hormones.

After this introduction and a hypothetical mediation scenario (Part I), Part II reviews the physiologic stress response including a discussion of stress triggers, both generally and specifically in mediation. Two hormonal responses to stress that are most relevant to the time constraints of mediation are described in detail. Part III discusses the impact of the stress response on the brain and body and how each impact plays out in the mediation context. Part IV considers specific techniques mediators can use to regulate the stress response and the science behind the effectiveness of these tools. Part V deals with the behavioral responses to stress and how they are expressed in mediation. Part VI returns to the mediation scenario below and suggests best practices to conduct mediation. Part VII presents our conclusions.

Let's start with a hypothetical mediation scenario:

> Tina and Morgan formed a partnership six years ago to purchase a thirty-six-unit vintage apartment building to rehab and convert into condominiums. The original plan was to rehab all thirty-six units over five years and then convert the building to condominium ownership. A severe economic downturn intervened and six years later, only twelve units had been rehabbed.
>
> The partners had worked together on other projects for many years; Morgan had done several personal construction projects for Tina and Tina had been Morgan's accountant. Their understanding upon forming the partnership was that Tina would handle the bookkeeping and tax preparation. In addition, Tina brought in investors who put up most of the capital for the project.

Morgan was tasked with maintaining the building and overseeing the rehabs.

The partners had worked well together, but during the last six months they had a falling out over when to sell the building. Tina and Morgan each believed the other partner had acted fraudulently and they had not spoken to each other for four months. Each engaged an attorney and threatened to sue the other. They chose mediation to try and work out a solution. Neither party has been part of a legal proceeding before, and the mediation was held in an unfamiliar downtown office building.

Both partners, their attorneys, and the mediator started out in joint session. After the mediator's opening statement, the attorneys each presented a very adversarial opening statement, accusing the other partner of fraud. Then the mediator encouraged both parties to vent their feelings, whereupon the partners argued vehemently. The mediator tried to gather additional information, but the session continued with angry accusations from both partners and their attorneys. The mediator tried to acknowledge their emotions in an effort to calm the situation, but the parties continued to yell at each other. Morgan stormed out of the mediation session and nothing was accomplished.

What happened? Two partners who were able to work together for years have become bitter opponents with no interest in hearing how the other side views the conflict. The mediator thought that letting the two partners vent their anger might allow them to "get it off their chest," and also to hear the other's point of view, but emotions ran too high and the mediator could not reestablish a working environment. The partners now think mediation is a waste of time and their attorneys are convinced that joint sessions in mediation do not work.

Are there commonalities between this case and other conflict situations that can provide insight for a better resolution? Can understanding the neuroscience of conflict help mediators devise a more successful process? This paper addresses these questions and presents neuroscientific information that both support some of the traditional mediation practices and also suggest new techniques for achieving a satisfactory resolution.

II. THE STRESS RESPONSE DURING CONFLICT

This section presents biological details necessary for understanding the basis and rationale for applying the neuroscience of stress and conflict to mediation. The scientific concepts will be further expanded and linked directly to the mediation process in Parts III and V. The science of the physiological stress response is even more complex and highly nuanced than described here, and a full discussion is far beyond the scope of this paper. Rather, our goal is to assist attorneys and other ADR practitioners in understanding the information most critical for analyzing the effectiveness of diverse mediation strategies and understanding the neuroscientific rationale for new strategies. In Parts IV and VI, we will present a roadmap to help practitioners deal with the silent, invisible stress responses that can alter the course of mediation.

A. *Physiology, the Brain, and Stress Triggers*

1. *What Is "Stress"?*

Conflict triggers a physiological stress response that changes how we perceive other people, evaluate threats and danger, and solve problems in addition to a host of body changes that maximize, in the short term, our physical ability to handle physical, psychological, and social threats.[2] The term "stress" refers to a physiological response to a challenge that is greater than the resources available to handle it. In other words, it is a perturbation of the homeostasis that keeps the various systems of the body in balance.

[2] *See generally* WALTER B. CANNON, BODILY CHANGES IN PAIN, HUNGER, FEAR, AND RAGE: AN ACCOUNT OF RECENT RESEARCHES INTO THE FUNCTION OF EMOTIONAL EXCITEMENT (1915); WALTER B. CANNON, THE WISDOM OF THE BODY (1932); HANS C. SELYE, THE STRESS OF LIFE (1956); G. Fink, *Stress Controversies: Post-Traumatic Stress Disorder, Hippocampal Volume, Gastroduodenal Ulceration*, 23 J. NEUROENDOCRINOLOGY 107 (2011); Bruce S. McEwen, *The Brain on Stress: Toward an Integrative Approach to Brain, Body, and Behavior*, 8 PERSP. PSYCHOL. SCI. 673 (2013).

The stress response involves the nervous system, hormones, and the immune system. Importantly, stress can have many positive consequences, especially during conflict, by preparing the brain and the body to do what it needs to do to protect itself when handling a threat and then to heal itself after any injury.

The physiological stress response acts throughout the body to serve five major functions:[3]

(a) Energy, in the form of glucose and fat, is mobilized making it available to the muscles for action and the brain for strategizing and decision-making.
(b) Oxygen availability to muscles and the brain is increased when heart rate and respiration go up and bronchi in the lungs dilate.
(c) Heightened alertness, caused by brain arousal and reflected in pupil dilation, facilitates cognitive tasks.[4]
(d) The immune system is altered to enhance the ability to heal wounds and fight infection, even in anticipation of a fight, before there is any injury.[5]
(e) Resources and energy expenditure are shunted away from the gut and the digestive system until the threat has past, and also away from the reproductive system and growth metabolism.

This physiological stress response is similar among vertebrate species[6] having its origin in invertebrates.[7] The stress response we see in humans

[3] CANNON, BODILY CHANGES IN PAIN, *supra* note 2; CANNON, THE WISDOM OF THE BODY, *supra* note 2; SELYE, *supra* note 2; Fink, *supra* note 2; McEwen, *supra* note 2.
[4] J. Martin & S. Johnston, *Target Detection in Visual Search: Unravelling the Pupillary Response*, 15 J. VISION 782, 782 (2015). *See generally* A. A. Zekveld et al., *Pupil Response as an Indication of Effortful Listening: The Influence of Sentence Intelligibility,* 31 EAR & HEARING 480 (2010).
[5] *See generally* Kirstin Aschbacher et al., *Good Stress, Bad Stress and Oxidative Stress: Insights from Anticipatory Cortisol Reactivity*, 38 PSYCHONEUROENDOCRINOLOGY 1698 (2013).
[6] *See generally* Randolph M. Nesse & Elizabeth A. Young, *Evolutionary Origins and Functions of the Stress Response*, 2 ENCYCLOPEDIA STRESS 79 (2000); *See generally* Oyvind Overli et al., *Evolutionary Background for Stress-Coping Styles: Relationships between Physiological, Behavioral, and Cognitive Traits in Non-Mammalian Vertebrates,* 31 NEUROSCIENCE BIOBEHAVIOR REV. 396 (2007).
[7] *See generally* Shelley A. Adamo, *The Effects of the Stress Response on Immune Function in Invertebrates: An Evolutionary Perspective on an Ancient Connection*, 62 HORMONES & BEHAVIOR 324 (2012); E. Ottaviani & C. Franceschi, *The*

likely began its evolution 700 million years ago in fish, if not earlier. Stress is a physiological change throughout the body and brain, and is so ancient and embedded in our physiology, that we cannot avoid it or override it, even when in the professional and seemingly rational context of mediation. The physiological stress response is virtually the same even though the circumstances and events that trigger it are very diverse, often species specific and individualized.

When a person is physically threatened, the brain is also immediately involved. That person must evaluate the level of threat and the resources available to handle that threat. Next is the decision to counterattack or flee ("fight or flight"), two actions that take energy, strength, and coordination. Choosing a course of action requires assessing the opponent, evaluating the potential success of various attack strategies, and identifying possible escape routes. As we shall see in Part II.A.3 below, psychological, emotional, and social threats create the same response as physical threats.

2. *Being Stressed vs. "Feeling Stressed"*

In this article, the term "stress" will be used to refer to this suite of physiological responses, not the psychological experience of feeling "stressed." The physiological stress response is not always consciously perceived as what we colloquially refer to as "being stressed." For example, someone may say "I am so stressed" when waiting for the Powerball lottery results to be announced, or when facing the many challenges of a complex negotiation, but not be particularly stressed physiologically because the threat is low, or because they have more than enough resources to adequately handle the challenge.

Conversely, a bride may only express her delight at being married, when in fact she is experiencing a stress response to this major life transition, which includes some loss of individual control and the familiar social role of being single. Likewise, many consider buying their first house as attaining the "American Dream," and are congratulated rather than consoled; yet new home ownership is a major life stressor (something that triggers the physiological stress response). It usually requires shouldering the financial demands of a mortgage for the first time as well as sole responsibility for the property; new owners may doubt that they have the experience or resources for handling these challenges.

Neuroimmunology of Stress from Invertebrates to Man, 48 PROGRESS NEUROBIOLOGY 421 (1996).

Saying that you "feel stressed" is one way of expressing a negative emotion.[8] But, using this phrase is imperfectly correlated with physiological stress. People who use it may not be physiologically stressed, and those who are physiologically stressed may not describe themselves with this phrase. Because it is physiological stress that has a direct effect on the brain and body, we will focus on the physiological stress response in the context of mediation.

3. *Stressors Trigger the Stress Response*

The trigger for the physiological stress response is termed a "stressor," but is not stress itself. Stressors are the events or situations that trigger a physiological stress response, such as physical attack by a predator, injury, extreme cold exposure, seeing someone with a gun, or witnessing a fatal accident. These physical responses make sense in the classic context of physical "fight or flight" triggered by a physical threat.

But just as important as physical danger are psychological, emotional and social threats, termed emotional and social stressors. Reliving a traumatic event is a stressor, particularly for those suffering from post-traumatic stress disorder. Venting strong emotions, such as anger and fear, can be a stressor, particularly in front of an adversary. The burden of caring for a spouse with Alzheimer Disease or a chronically ill child is a stressor, particularly if a person has little control over disease symptoms and if there are not enough supports to outweigh the demands of the situation. The two most potent psychological stressors are being negatively evaluated by others and not having a sense of control.[9]

Distinguishing "stressors" from "stress" is important because the same event may trigger a stress response in one person, but not another, based on how big they perceive the threat to be and the number of resources they believe are available. Because perception of an event as a stressor is key, as well as the balance between the threat and available resources, mediators may have the capacity to modulate the physiological stress response by changing the parties' assessment and experience of their situation.

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[8] *See generally* Sheldon Cohen et al., *A Global Measure of Perceived Stress*, 24 J. HEALTH & SOC. BEHAV. 385 (1983).

[9] *See generally* Sally S. Dickerson & Margaret E. Kemeny, *Acute Stressors and Cortisol Responses: A Theoretical Integration and Synthesis of Laboratory Research*, 130 PSYCHOL. BULL. 355 (2004).

4. *Stressors During Mediation*

The typical mediation session is fraught with potential stressors, stressors that have been well established in similar contexts[10] as well as extensive psychological research. Psychological stressors include complete unfamiliarity with surroundings and process, recalling negative emotional events and threatening situations, being the only naïve person in a meeting with professionals, and a lack of control. Social stressors include fear of negative judgment by others, verbal conflict, threats to social status, social isolation, and shaming.

Occasionally mediation sessions devolve into situations where one or more participants feel the threat of imminent physical harm,[11] but more often parties experience psychological and social threats. Moreover, parties to mediation will frequently be subject to many different stressors all at once or over a short time and the impact will be cumulative. Even before the mediation session itself, anticipating the session can trigger the stress response because mediation is an unfamiliar process and because it is part of an ongoing conflict situation. Simply trying to find an unfamiliar location can trigger the response and this is heightened if a party is anticipating a face-to-face meeting with an adversary. If the mediation begins with a joint session, stress can be triggered while listening to the opposing attorney's account of an event, especially when that account conflicts with a party's own views. This too can be heightened if the party is called upon to talk about an emotional flashpoint from the past. Further into the process, parties may be challenged to come up with novel solutions, some of which are perceived as risky, or feel pressure to compromise their positions. Both of these situations can trigger the stress response.

Attorneys are also faced with stressors in mediation. New attorneys and attorneys with little experience in mediation may be most affected by stress triggers; even experienced attorneys' stress response may be triggered

[10] *See generally* J. M. Coates & J. Herbert, *Endogenous Steroids and Financial Risk Taking on a London Trading Floor*, 105 PROC. NAT'L ACAD. SCI. U.S. 6167 (2008); Vicki R. LeBlanc, *The Effects of Acute Stress on Performance: Implications for Health Professions Education*, 84 ACAD. MED. S25 (2009).

[11] One of the coauthor's (JST's) very first mediation involved a landlord/tenant dispute in a location with no screening for weapons. The landlord was tall, broad, heavily muscled, and displayed many tattoos. As a physically small woman the mediator had second thoughts about her new chosen profession. Fortunately, the mediation went well and the parties settled without any angry outbursts, but she has to assume her cortisol level was very high!

because they fear negative evaluation by their clients, the other attorney, or the mediator.

Mediators are, by definition, dealing with social conflict regardless of the substantive nature of the dispute, and emotional stressors abound in all mediations. Even in commercial disputes between large institutions, social stressors are still ubiquitous because there are individual people involved. These institutional representatives can feel judged, threatened, and out of control just as individuals who are personally involved.

B. *Fast and Slow Hormonal Stress Responses*

Social and physical stressors trigger the same cascade of brain, hormonal, and immune stress responses, which in turn changes the way the brain functions and ultimately turns off the stress response.[12] Some components of this cascade respond immediately, while others take longer to develop, with recovery from the slower responses taking longer.[13] Here we describe the adrenalin and cortisol responses, the two components that act during the time frames most directly relevant to mediation.[14]

1. *Fast Adrenalin Stress Response*

The sympathetic nervous system[15] is the first to react to an acute stressor, such as speaking in front of a hostile, judgmental audience. In under a

[12] CANNON, BODILY CHANGES IN PAIN, *supra* note 2; CANNON, THE WISDOM OF THE BODY, *supra* note 2; SELYE, *supra* note 2; Fink, *supra* note 2; McEwen, *supra* note 2.

[13] *See generally* Constantine Tsigos & George P. Chrousos, *Hypothalamic-Pituitary-Adrenal Axis, Neuroendocrine Factors and Stress*, 53 J. PSYCHOSOMATIC RES. 865 (2002).

[14] We use the common term "adrenalin" for the molecule released by the sympathetic nervous system from the adrenal medulla, the interior portion of the adrenal glands that sit atop the kidneys. In the scientific literature this same molecule is typically referred to as "epinephrine." Moreover, noradrenalin (norepinephrine) is also released from the adrenal medulla and the brain during the stress response. Its function is similar: heightening awareness, focus, and the ability to respond quickly. It also prioritizes energy allocation to the brain and muscles by restricting blood flow to the areas less important for coping, such as the skin. Because the two are highly correlated both in their release and function, for simplicity we will focus on adrenalin/epinephrine, using the term "adrenalin." For a more detailed discussion, see Tsigos & Chrousos, *supra* note 13.

[15] The sympathetic nervous system is one of two parts of the autonomic nervous system, which unconsciously regulates key body functions such as beating of the heart; the smooth muscles, including gut muscles that perform digestion; urination; breathing; pupil responses; sexual function; glands that release hormones; and the organs and glands of the immune system. The other part of the autonomic nervous system is the

minute, adrenalin is released from the adrenal medulla into the blood stream as well as from other sympathetic nervous system neurons in various other organs.[16] These neuroendocrine molecules bind throughout the body with widespread coordinated effects that contribute to overall physiological stress response described above (II.A.1.a-e): increased attention, heart rate, blood pressure, respiration, pupil dilation, energy availability, and immunity wound healing.[17] At the same time, adrenalin inhibits digestive, thyroid, and reproductive function as well as inflammation.[18] When the threat is over, recovery typically occurs within two to three minutes and is certainly complete within twenty minutes.[19]

The sympathetic response will be triggered if a person is startled by a loud noise, or steps into the street only to notice a rapidly approaching city bus. In a classic study[20] of a student taking his doctoral exams—a time marked by mental, emotional, and social stressors—his adrenalin levels spiked on the day of the exam and dropped afterwards.

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parasympathetic nervous system. The two parts counterbalance each other. The sympathetic nervous system coordinates arousal, e.g. "fight or flight," while the parasympathetic nervous system coordinates restorative functions, e.g. "rest and digest" or "breed and feed." The sympathetic nervous system is controlled by the hypothalamus in the brain, with synapses in the spinal cord, and generally coordinates rapid mobilizing responses while the parasympathetic nervous system operates more slowly and counterbalances the arousal of the sympathetic nervous system. Tsigos & Chrousos, *supra* note 13.

[16] *See generally* Myriam V. Thoma et al., *Acute Stress Responses in Salivary Alpha-Amylase Predict Increases of Plasma Norepinephrine*, 91 BIOLOGICAL PSYCHOL. 342 (2012).

[17] *See e.g.*, Aschbacher et al., *supra* note 5; Fink, *supra* note 2; McEwen, *supra* note 2; A. Kalsbeek et al., *Hypothalamic Control of Energy Metabolism Via the Autonomic Nervous System*, 1212 ANNALS N.Y. ACAD. SCI. 114 (2010).

[18] *See* Vikram Bhatia & Rakesh K. Tandon, *Stress and the Gastrointestinal Tract*, 20 J. GASTROENTEROLOGY & HEPATOLOGY 332 (2005). *See also* A. Mayerhofer et al., *Evidence for Catecholaminergic, Neuronlike Cells in the Adult Human Testis: Changes Associated With Testicular Pathologies*, 20 J. ANDROLOGY 341 (1999); M.A. Pisarev et al., *Modulation of Thyroid Function by the Sympathetic Nervous System*, 116 PROGRESS CLINICAL & BIOLOGICAL RES. 105 (1983); Sae Uchida, *Sympathetic Regulation of Estradiol Secretion from the Ovary*, 187 AUTONOMIC NEUROSCIENCE 27 (2015).

[19] *See* Tsigos & Chrousos, *supra* note 13.

[20] Marianne Frankenhaeuser, *Psychoneuroendocrine Approaches to the Study of Emotion as Related to Stress and Coping*, 26 NEB. SYMP. ON MOTIVATION 123 (1978).

2. *Slow Cortisol Stress Response*

Like adrenalin, cortisol is released immediately after detecting a stressor. However, cortisol that originates in the adrenal cortex is released more slowly than adrenalin, and its response follows a longer time course. Cortisol rises during the stressor, but, in contrast to adrenalin, often continues rising after the stressor is over, peaking twenty minutes afterwards for a mild stressor or much longer for emotionally traumatic events. Cortisol can also rise in anticipation of an emotional stressor, such as having to speak in front of a hostile audience, as can happen during mediation.

Full recovery to baseline levels is rarely achieved until two hours after the stressor is gone, and does so by feeding back to the brain to turn down the mechanisms stimulating its rise.[21] If there is not enough time for recovery, a second bolus of cortisol is triggered, which builds on the first response, and when repeated over and over creates chronically high levels of cortisol.[22] Because it has a long recovery time upon which to build, there is a higher risk of accumulating chronically elevated cortisol levels than there is for adrenalin. High chronic cortisol can be sustained not only for hours but for months if multiple stressors continue without an opportunity for recovery.[23]

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[21] Corticotropin Releasing Factor (CRF) from the brain and Adrenocorticotrophic Hormone (ACTH) from the pituitary, an endocrine organ sandwiched between the brain and the roof of the mouth, together stimulate a rise in cortisol. CRF is a neurohormone and neurotransmitter that stimulates the production and release of Adrenal Corticotropic Hormone (ACTH) from the pituitary, which in turn stimulates synthesis and release of cortisol from the adrenal cortex, resting on top of each kidney. CRF is produced in the paraventricular nucleus of the hypothalamus and is released at the median eminence into a miniscule specialized circulatory system linking the brain with the pituitary just below it. Tsigos & Chrousos, *supra* note 13.

[22] *See* Tsigos & Chrousos, *supra* note 13; Hans C. Selye, *A Syndrome Produced by Diverse Nocuous Agents*, 138 NATURE 32 (1936); Shelley E. Taylor, *Health Psychology: The Science and the Field*, 45 AM. PSYCHOLOGIST 40 (1990).

[23] Selye, *supra* note 22, at 32. Selye set the stress response in the context of everyday life when multiple stressors often occur. He called this process "the General Adaptation Syndrome," and distinguished its three phases. The "alarm phase," an immediate stress response to a punctate event or stressor; the "resistance phase," when the body re-equilibrates in the face of sustained or repeated stressors; and the "exhaustion phase," when the resources of the environment and body are depleted and it can no longer mount a stress response, even to a severe stressor.

In sum, cortisol starts to rise within seconds of the stressor and the rapid adrenalin stress response, continues to rise after the stressor ends, and then typically recovers to baseline within one to two hours. In the resistance phase, high levels of cortisol are sustained; not even dropping in the evening when cortisol is typically at its nadir. During the exhaustion phase, the adrenal cortex is depleted and cortisol is low even in the early

Cortisol prioritizes the physical and mental responses essential for handling a threat or stressor; whether physical, psychological, or social.[24] A behavioral response requires thought and neuromuscular action that takes energy. Cortisol increases sugars (glucose) in the bloodstream and its use by the muscles, heart, and brain; it releases fats stored in the liver; increases catabolism (breaking down molecules to creating energy for cells);[25] and increases the availability of immune molecules that promote wound healing and fight infection.[26] Cortisol also inhibits the vegetative systems that are not immediately essential for survival during a "fight-or-flight" situation: it disrupts feeding and digestion, suppresses the reproductive system, slows growth processes, and disrupts sleep;[27] it also inhibits inflammation and associated swelling and pain that can interfere with action.[28]

At the same time, emotions and thoughts are equally crucial responses. Cortisol immediately travels to the different brain regions that regulate the plethora of psychological functions essential for an effective mediation. The experience and perception of fear and anger are affected by cortisol's action in the amygdala,[29] memory by its binding in the hippocampus,[30] reasoning, and decision-making by its effects on the frontal and prefrontal cortex,[31] and

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morning when it is usually at its peak and an acute alarm phase response is no longer feasible.

In the context of mediation, it is the alarm phase that is most important, recognizing that repeated stressors can sustain high cortisol for the entire mediation session and even across multiple sessions. The typical issues in mediation, such as foreclosure, custody, or business failure, are not usually sufficient by themselves to cause chronic stressors to the point of the exhaustion phase. *See also* Tsigos & Chrousos, *supra* note 13; Taylor, *supra* note 22, at 40.

[24] Dickerson & Kemeny, *supra* note 9; Margaret E. Kemeny, *The Psychobiology of Stress*, 12 CURRENT DIRECTIONS PSYCHOL. SCI. 124, 125 (2003).

[25] *See generally* George P. Chrousos, *Stress and Disorders of the Stress System*, 5 NATURE REV. ENDOCRINOLOGY 374 (2009).

[26] Firdaus S. Dhabhar, *Effects of Stress on Immune Function: The Good, the Bad, and the Beautiful*, 58 IMMUNOLOGY RES. 193, 194 (2014).

[27] Chrousos, *supra* note 25, at 376.

[28] Dhabhar, *supra* note 26, at 194.

[29] *See generally* Joseph E. LeDoux, *Brain Mechanisms of Emotion and Emotional Learning*, 2 CURRENT OPINIONS NEUROBIOLOGY 191 (1992); Shinya Makino et al., *Psychological Stress Increased Corticotropin-Releasing Hormone mrna and Content in the Central Nucleus of the Amygdala but not in the Hypothalamic Paraventricular Nucleus in the Rat*, 850 BRAIN RES. 136 (1999).

[30] Sven-Åke Christianson, *Emotional Stress and Eyewitness Memory: A Critical Review*, 112 PSYCHOL. BULL. 284 (1992); Bruce S. McEwen, *Physiology and Neurobiology of Stress and Adaptation: Central Role of the Brain*, 87 PHYSIOL REV. 873, 875 (2007).

[31] *See generally* Joaquín M. Fuster, *The Prefrontal Cortex—An Update: Time Is of the Essence*, 30 NEURON 319 (2001); Ron M. Sullivan & Alain Gratton, *Lateralized Effects*

processing of incentives and rewards by regulating the mesolimbic dopamine systems.[32] Cortisol binding in these different brain regions produces the benefits and costs of the stress response during mediation, which are discussed in Part III.

3. *Regulation by the Brain*

The fast and slow components of the neuroendocrine stress response both originate in the brain in a structure called the hypothalamus.[33] The two arms have different time courses, however, because the brain and nervous system mechanisms play different roles.[34] In the fast adrenalin response, only two neurons are needed to carry signals from the brain (hypothalamus), to the spinal cord and from there to the adrenal medulla (the core of the adrenal gland) to release adrenalin into the blood.[35] Once in circulation, its rise is detected by the brain, which then turns down the neural signals producing the hormone, a regulatory process termed negative feedback.[36] This hypothalamic-autonomic nervous system is universal across vertebrate species including humans.[37]

In contrast, the cortisol system requires that molecules be transported from the hypothalamus by blood, rather than neurons; a much slower process.[38] The neurohormone, Cortisol Releasing Factor (CRF), is released from the hypothalamus but must travel by a special circulatory system to the pituitary gland, stimulating release of Adrenocorticotropic Hormone (ACTH) into the general circulation. In turn, this hormone binds in the adrenal cortex, an outer layer of the adrenal gland, and stimulates release of cortisol.[39] Cortisol feeds back to the brain through the bloodstream, where rising levels reduce production of CRF and ACTH and cortisol ultimately recovers to pre-stress levels.[40]

Because both of these molecules are carried throughout the body, they are an excellent mechanism for coordinating all the different components of

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of Medial Prefrontal Cortex Lesions on Neuroendocrine and Autonomic Stress Responses in Rats, 19 J. NEUROSCIENCE 2834 (1999).

[32] Peter W. Kalivas & Nora D. Volkow, *The Neural Basis of Addiction: A Pathology of Motivation and Choice*, 162 AM. J. PSYCHIATRY 1403 (2005); McEwen, *supra* note 30.

[33] Chrousos, *supra* note 25.

[34] *Id.*

[35] *Id.*

[36] *Id.*

[37] *Id.*

[38] *Id.*

[39] *Id.*

[40] *Id.*

the stress response. Together, they affect the myriad changes preparing the body for action as well as how the brain processes information, evaluates best options, and makes decisions. Each response begins within seconds of being confronted by a stressor, but the duration of the response itself, and the time it takes to recover, are markedly different.

This article focuses on the longer cortisol stress response because there is ample research demonstrating that it is particularly sensitive to social challenges[41] in how it affects the brain and thereby the psychological processes that are essential to a successful mediation, as itemized above in Part II.B.2. In addition, because the response and recovery is slower, triggering the cortisol response puts parties at risk for building a sustained stress response during mediation, compromising their ability to negotiate an acceptable resolution. The question is, how can mediators structure the session to avoid triggering a disruptive stress response or at least attenuate it when it does occur? We shall come back to this question in Part IV.

III. COSTS AND BENEFITS OF PHYSIOLOGICAL STRESS DURING MEDIATION

A. *Perception of Anger, A Social Stressor*

1. *Neuroscience*

Anger is often an undercurrent during mediation, if not overt, and poses a social threat to the parties. It is a universal emotion signaled by the same distinct facial expressions seen across cultures: furrowed brows, pursed mouth, and flared nostrils; a facial expression that is universally perceived as threatening.[42] High cortisol makes people more sensitive to angry faces, especially among people who are particularly sensitive to social threats.[43]

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[41] *See generally* James P. Herman et al., *Central Mechanisms of Stress Integration: Hierarchical Circuitry Controlling Hypothalamo-Pituitary-Adrenocortical Responsiveness*, 24 FRONT NEUROENDOCRINOLOGY 151 (2003).

[42] *See generally* PAUL EKMAN, The FACE OF MAN: EXPRESSIONS OF UNIVERSAL EMOTIONS IN A NEW GUINEA VILLAGE (1980).

[43] Karin Roelofs et al., *On the Neural Control of Social Emotional Behavior*, 4 SOC. COGNITIVE AND AFFECTIVE NEUROSCIENCE 50, 53 (2009); Jacobien M. van Peer et al., *Cortisol-Induced Enhancement of Emotional Face Processing in Social Phobia Depends on Symptom Severity and Motivational Context*, 81 BIOLOGICAL PSYCHOL. 123, 128 (2009); Jacobien M. van Peer et al., *The Effects of Cortisol Administration on Approach-Avoidance Behavior: An Event-Related Potential Study*, 76 BIOLOGICAL PSYCHOL. 135, 136, 137, 141 (2007). Paradoxically, giving cortisol to someone with high social anxiety

Cortisol regulates perception of angry faces specifically and not happy faces, speeding up processing and reactions to them; even when so fleeting that people are not consciously aware that they have even seen a face, let alone an angry expression. Because the intensity of an angry facial expression can vary from very intense to very subtle and nuanced, cortisol can increase the parties' sensitivity to subtly angry faces and their perceived threat. Cortisol has this effect by modulating activity in amygdala circuits, a part of the brain involved in processing anger and fear[44] and does so preconsciously, even before the brain finishes processing the face as a conscious experience.[45]

2. *Mediation Context*

In mediation, a high cortisol stress response runs the risk of making the stressed party perceive people in the room—the other party, the mediator, and attorneys—as angrier and a greater threat than they actually are. A stressed party or attorney will be more likely to misinterpret the intentions of the other party and perceive more hostility than is actually present. This will make it more difficult to facilitate information exchange and more difficult for a party to clearly see the interests of the other party. For example, in an employment dispute, an employee who is highly stressed will be more likely to attribute his firing to discrimination and find it more difficult to accept other explanations for the firing.

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reduces, rather than increases, the perception of threatening angry faces that induce fear. The key to resolving this apparent paradox is recognizing that cortisol regulates the brain to maintain steady levels through its negative feedback mechanism (*see infra* Part II.A.5). For example, if a person is chronically stressed and fearful and has high cortisol that increases their sensitivity to threat, their brain's "set point" for the physiological negative feedback system is correspondingly higher than average, maintaining their elevated cortisol levels. For them, any additional cortisol is enough to activate the negative feedback and reduce their endogenous cortisol and thereby their perception of emotional stressors such as threat and fear. *See generally* Peter Putman et al., *A Single Administration of Cortisol Acutely Reduces Preconscious Attention for Fear in Anxious Young Men.*, 32 PSYCHONEUROENDOCRINOLOGY 793 (2007). In short, the brain and endocrine system are wired such that cortisol, when in the alarm phase, if not the adaptation phase, optimizes detection of anger in most people, without paralyzing those that are already hypersensitive.

[44] LeDoux, *supra* note 29, at 192; Makino et al., *supra* note 29, at 141; Sarina M. Rodrigues et al., *The Influence of Stress Hormones on Fear Circuitry*, 32 ANN. REV. NEUROSCIENCE 289, 292 (2009).

[45] *See generally* van Peer et al., *Cortisol-Induced Enhancement, supra* note 43; van Peer et al., *The Effects of Cortisol Administration*, *supra* note 43.

Also, a more stressed party may over-react to an offer that she perceives is too low (or a demand perceived as too high) and this will interfere with effective negotiations. Highly stressed parties may be particularly susceptible to reactive devaluation, a psychological principal that an offer from an adversary is less valued than the same offer from a neutral.[46]

B. *Selective Attention*

1. *Neuroscience*

Stress focuses the mind on the task at hand. Under low stress, extraneous information is distracting and interferes with efficiently getting the information needed to problem solve or complete a task. Under moderate stress conditions, such as a surgical resident taking an exam, however, attention narrows to focus on the most important information and attention to extraneous information falls away, allowing improved fundamental surgical skills.[47] However, under high stress conditions, such as performing a complex surgery through a small incision in the abdomen, selective attention fails and, without extensive experience, high stress impairs surgical performance.[48]

In addition, a rise in cortisol makes it difficult to ignore the distressing negative emotions that impair selective attention to the details of the task at hand. It does so by intensifying amygdala activity to negative stimuli and its connections with the frontoparietal cortex, a system that enables deciding which actions to prioritize.[49] After recovery, the interconnections between the amygdala and the frontoparietal cortex, as well as the insula are weakened, reducing emotional interference with evaluating information and decision-making.

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[46] Richard Birke & Craig R. Fox, *Psychologial Principles in Negotiating Civil Settlements*, 4 HARV. NEGOT. L. REV. 1, 48 (1999).

[47] Eran Chajut & Daniel Algom, *Selective Attention Improves Under Stress: Implications for Theories of Social Cognition*, 85 J. PERSONALITY & SOC. PSYCHOL. 231, 232, 236, 241 (2003); Vicki LeBlanc et al., *Examination Stress Leads to Improvements on Fundamental Technical Skills for Surgery*, 196 AM. J. SURGERY 114, 117, 119 (2008).

[48] Sonal Arora et al., *The Impact of Stress on Surgical Performance: A Systematic Review of the Literature*, 147 SURGERY 318, 326 (2010).

[49] *See* Marloes J. A. G. Henckens et al., *Time-Dependent Effects of Cortisol on Selective Attention and Emotional Interference: A Functional MRI Study*, FRONTIERS INTEGRATIVE NEUROSCIENCE, Aug. 28, 2012, at 7.

2. *Mediation Context*

During mediation, moderately stressed parties will effectively focus their attention on the information, alternative options, and decisions that need to be made. However, too much stress and hyperfocus can lead to perseveration, making it difficult to take in other information that is not in fact extraneous, but necessary to reframe a problem, reassess options, and make decisions.

In the early stages of mediation, parties may be subject to multiple stressors and develop high cortisol loads that result in trouble focusing or accepting alternative views. As a day-long mediation progresses, the frequency of stressors is likely to decrease and may fall to such an extent that it becomes difficult for the party to focus because of low cortisol levels. Later in the day, time constraints can be mild stressors that optimize the cortisol level for settlement discussions.

The cortisol effect on emotional attention indicates that in the decision-making phase of a mediation, moderately stressed parties will be able to appropriately focus on their options and interests and be able to make a well-reasoned decision on whether to accept or reject a proposed settlement. Parties that are subject to higher acute stress levels, however, will find it harder to weigh alternatives and make a decision; this is why it is important to give parties sufficient time between the higher stress periods at the start of mediation and the decision-making at the end of the process.

C. *Memory*

1. *Neuroscience*

It is commonly recognized that stress impairs memory; witnesses of a horrific crime typically have conflicting memories of its details. But the effects of stress are more nuanced. Cortisol not only increases sensitivity to angry faces, but, in men, it makes them remember angry faces more accurately than fearful faces.[50]

Cortisol binds in the hippocampus, which plays a central role in forming long-term memories. It has only a weak effect on what is called short term or working memory, the ability to hold information just long enough to act, such as looking up a phone number before dialing it. Cortisol can, however,

[50] Peter Putman et al., *Exogenous Cortisol Shifts a Motivated Bias From Fear to Anger in Spatial Working Memory for Facial Expressions*, 32 PSYCHONEUROENDOCRINOLOGY 14, 15, 17 (2007).

disrupt the consolidation of "long term" memory of an event that is necessary for it to be recalled thirty to ninety minutes later, particularly if many things happened between the original event and its recall.[51] But even this summary requires nuanced distinctions. When highly negative emotional events trigger the stress response, there is excellent memory for details central to that event, and poor memory for peripheral details.[52] But for non-emotional stressors, the opposite is true; memory for peripheral events is better.[53]

2. *Mediation Context*

In a mediation about a stressful event, the parties may have different memories about that initial event. Even if the initial event was not stressful, the physiological stress encountered toward the beginning of a mediation may alter the memories of information, emotions, and attitudes experienced during the mediation when they are recalled later in the day. The mediator should be sensitive to the fact that physiological stress can promote remembering and misremembering what happened initially, and within the session. Mediator instructions and statements made by other parties or attorneys in early stages of mediation may be misremembered later in the process. Mediators should be prepared to summarize what was said earlier in the day to help stressed parties understand where the opposing party stands and to make sure stressed parties have accurate information when weighing alternatives in the decision-making phase of the mediation.

D. *Problem Solving and Decision-Making*

1. *Neuroscience*

Reaching a settlement typically requires that each party relinquish their initial position, if only to consider their best alternative outcomes and strategies. This type of problem solving requires cognitive flexibility.[54] After a stressor, people lose this flexibility and stay focused on their original goal, in part because they block out what they perceive as extraneous information.[55] This inflexibility lasts as long as the cortisol response,

[51] Rodrigues et al., *supra* note 44, at 297-99.
[52] Christianson, *supra* note 30, at 291.
[53] *Id.*
[54] *See* Stephanie Wemm et al., *The Role of DHEA in Relation to Problem Solving and Academic Performance*, 85 BIOLOGICAL PSYCHOL. 53, 54, 58-59 (2010).
[55] *Id.* at 54, 58-59; Franziska Plessow et al., *Inflexibly Focused Under Stress: Acute Psychosocial Stress Increases Shielding of Action Goals at the Expense of Reduced*

increasing during the half hour after a stressor. Likewise, cortisol impairs multitasking.[56] This cognitive inflexibility is consistent with cortisol binding in the prefrontal cortex.[57]

Mediation at its most fundamental is the parties deciding how to allocate rewards or benefits. Each party has to decide how to divide rewards, be they monetary, emotional, or other tangible options, between themselves and the other party. Interestingly, the following three different parts of the brain are involved in the three steps of this decision process: [58]

(a) Evaluating rewards for oneself;
(b) Evaluating forgone rewards (rewards to the other party or no rewards); and
(c) Calculating the balance among these options.

Cortisol modulates activity in each of the three brain regions that affect each step. Moreover, some of the options will be inherently threatening, such as forgoing a much-needed monetary reward. The amygdala, which regulates threat assessment and fear (see Part II.B.2.), is interconnected with each of the three brain areas in the decision process and cortisol modulates the strength of these interconnections. Thereby, threats and fear affect the decision process.[59]

Cognitive Flexibility with Increasing Time Lag to the Stressor, 23 J. COGNITIVE NEUROSCIENCE 3218, 3223-24 (2011).

[56] Franziska Plessow et al., *Better Not to Deal with Two Tasks at the Same Time When Stressed? Acute Psychosocial Stress Reduces Task Shielding in Dual-Task Performance*, 12 COGNITIVE AFFECTIVE & BEHAV. NEUROSCIENCE 557, 567 (2012).

[57] Franziska Plessow et al., *The Stressed Prefrontal Cortex and Goal-Directed Behaviour: Acute Psychosocial Stress Impairs the Flexible Implementation of Task Goals*, 216 EXPERIMENTAL BRAIN RES. 397, 397 (2012). *See* Nicolas W. Schuck et al., *Medial Prefrontal Cortex Predicts Internally Driven Strategy Shifts*, 86 NEURON 331, 336 (2015).

[58] Rewards for one's self are associated with the orbitofrontal cortex. Forgone rewards, either allocated to the other party or to no one, are associated with the anterior cingulate sulcus. Rewards, forgone rewards, and the decision are associated with the anterior cingulate gyrus, a potential locus for calculating the balance of selfish and social rewards. Steve W. Chang et al., *Neuronal Reference Frames for Social Decisions in Primate Frontal Cortex*, 16 NATURE NEUROSCIENCE 243, 249 (2013).

[59] C.W.E.M. Quaedflieg et al., *Temporal Dynamics of Stress-Induced Alternations of Intrinsic Amygdala Connectivity and Neuroendocrine Levels*, PLOS ONE, May 6, 2015, at 10.

Being in a risky, uncertain situation increases cortisol.[60] At low stress levels in the laboratory, cortisol makes men more likely to take a risky strategy when the payoff is high in a social competition game.[61] But in the really high-stakes environment of the commodities exchange, cortisol has the opposite effect, and reduces risk-taking by male traders.[62]

When faced with stressors, men and women differ markedly in their ability to inhibit the negative emotions that impede problem solving and decision-making. Among women, stress enhances their ability to inhibit negative emotions, whereas it does not in men.[63] These findings highlight sex differences in the impact of stress on emotion regulation, which is key to problem solving and decision-making in mediation. Men and women may also differ in other effects of cortisol and stress, an area that is understudied, which is particularly unfortunate given that women are often parties to mediation.[64]

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[60] *See* Coates & Herbert, *supra* note 10, at 6169-70 (stating a relationship between increased cortisol and financial uncertainty).

[61] Peter Putman et al., *Exogenous Cortisol Acutely Influences Motivated Decision Making in Healthy Young Men*, 208 PSYCHOPHARMACOLOGY 257, 260-61 (2010).

[62] Narayanan Kandasamy et al., *Cortisol Shifts Financial Risk Preferences*, 111 PROC. NAT'L ACAD. SCI. 3608, 3611 (2014).

[63] Valerie L. Kinner et al., *Emotion Regulation: Exploring the Impact of Stress and Sex*, FRONTIERS BEHAV. NEUROSCIENCE, Nov. 13, 2014, at 4-6. *See generally* Miguel Kazén et al., *Inverse Relation Between Cortisol and Anger and Their Relation to Performance and Explicit Memory*, 91 BIOLOGICAL PSYCHOL. 28 (2012) .

[64] Few studies have considered the sex of parties to mediation, and those that have gathered data from small claim cases. Collected data show women make up anywhere from 30% to 58% of parties. Presumably approximately 50% of the parties are women in divorce and custody mediations. MICHELE HERMANN ET AL., THE METROCOURT PROJECT FINAL REPORT: A STUDY OF THE EFFECTS OF ETHNICITY AND GENDER IN MEDIATED AND ADJUDICATED SMALL CLAIM CASES AT THE METROPOLITAN COURT MEDIATION CENTER BERNALILLO COUNTY, ALBUQUERQUE, NEW MEXICO CASES MEDIATED OR ADJUDICATED SEPTEMBER 1990 - OCTOBER 1991 22-24, 30-31, 35-46, 68 (1993). *See* MICHAEL FIX & PHILLIP J. HARTER, HARD CASES, VULNERABLE PEOPLE: AN ANALYSIS OF MEDIATION PROGRAMS AT THE MULTI-DOOR COURTHOUSE OF THE SUPERIOR COURT OF THE DISCTRICT OF COLUMBIA 91, 106, 116, 145 (1992); GLORIA JEAN GONG & CARL BRINTON, CONNECTICUT JUDICIAL BRANCH MORTGAGE FORECLOSURE MEDIATION PROGRAM EVALUATION 33 (2014). *See generally* Daniel Klerman & Lisa Klerman, *Inside the Caucus: An Empirical Analysis of Mediation from Within*, J. EMPIRICAL LEGAL STUD. (forthcoming).

2. *Mediation Context*

Decision-making and risk assessment is present throughout the mediation process. Although mediation pedagogy neatly divides the process into stages such as initiation, preparation, introduction, problem statement, problem clarification, generation and evaluation of alternatives, selection of alternatives, and agreement,[65] in fact these stages blur and merge in actual mediations. In the opening minutes of mediation, parties may quickly evaluate the process and decide to withdraw because they believe nothing useful will occur. Mediators need to provide support and information for these parties if they want to keep the mediation process going. In the clarification and alternatives stages parties may again decide to leave or may discount the information they are hearing or react negatively to the negotiation. Again, the mediator can try to help parties stay with the process in hopes of keeping the parties at the table long enough to reach settlement. In all of these cases, the mediator can focus on leveling out the peaks and valleys of the stress response using the techniques described in Part IV below. In general, moderate levels of cortisol will best serve decision-making functions.

The impact of cortisol level on risk taking suggests that highly stressed parties may become more entrenched in their original positions and be less willing to adopt novel alternative solutions developed during the session. Again, the mediator can try to reduce stressors to improve acceptance of novel alternatives.

We now see that when parties engage in evaluating their options, there is interplay between four different brain regions, including the amygdala, all regulated by cortisol. As each party evaluates their options, they will perceive risks and threats associated with each option and this may act as a stressor and release more cortisol. There is no way to avoid these emotional responses as part of decision-making. Mediators can continue to help parties work through the analysis of different options and support parties in their deliberations by drawing on the trust built up earlier in the mediation and emphasizing that the party continues to hold ultimate decision making power.

Men and women are often facing each other in divorce and other family mediations, but they react differently to the physiological stress response. Even in the unlikely event that the two parties have similar cortisol levels at any given moment in a mediation session, the impact of that level will affect their decision-making abilities differently. For example, when a mother and

[65] JOHN W. COOLEY, THE MEDIATOR'S HANDBOOK: ADVANCED PRACTICE GUIDE FOR CIVIL LITIGATION 3 (Thomas F. Geraghty et al. eds., 2d ed. 2006).

father are mediating the custody of their child, both experience similarly high levels of cortisol. As a result of the high cortisol levels, both the mother and the father will remain fairly rigid and try to hold on to their original positions. However, as they argue and negative emotions increase, the mother is more likely to be able to set aside the negative emotions to focus on decision-making while the father will continue to be mired in the negative emotion and be less likely to refocus on decision-making. Although documented in the laboratory,[66] the implications of these differences have never been studied in the context of mediation. It would certainly be enlightening to explore whether these differences have a systematic impact on the final decisions in custody and financial disputes in divorce.

E. *Optimal Performance at the "Sweet Spot"*

1. *Neuroscience*

In each of these psychological domains, cortisol has beneficial effects on psychological function up to intermediate levels and duration, but it then becomes deleterious if stressors become more intense, frequent, and emotional. Where is the optimal "sweet spot" on what can be called a cortisol "optimization curve"? That question is hard to answer, because there are so many different psychological functions involved simultaneously, each with a different optimization curve, and which will differ from person to person.[67] Nonetheless, there is a solid take home conclusion. Stress reduction is a goal when multiple intense stressors overwhelm parties during mediation. On the other hand, complete lack of stress is not the goal, because intermediate cortisol levels will likely help the parties focus on the decisions and come to a resolution satisfactory to them. The art of a successful mediator is to choose from among their many tools and talents to find the "sweet spot" for each particular party, being especially cognizant that men and women differ in their biological stress regulating systems as well as their coping styles.

[66] Kinner et al., *supra* note 54.

[67] Stress-responsive brain circuits, that are themselves hierarchically organized, achieve this integration of multiple functions and optimize the cortisol level. Each is fine-tuned to compare information from the environment and internal biological information from multiple limbic systems. When this fine-tuning mechanism no longer functions, pathology and disease results. Herman et al., *supra* note 41.

2. *Mediation Context*

Every gesture, posture, and word spoken by a mediator may either trigger more stress or help bring it down. Small talk about commuting may unintentionally trigger stress by reminding a party of the jerk who cut him off on the expressway that morning. Alternatively, trying to build rapport by emphasizing some positive, mutual emotion may help to bring stress down. Since these impacts are unavoidable, unpredictable, and undetectable, mediators might as well use all available tools to minimize stress triggers, especially at the start of mediation where multiple stressors are most likely to be present.[68] We will discuss these tools in detail below in Part IV.

Although the parties may be evenly matched in terms of stress, sometimes there is a large disparity. For example, in foreclosure mediation, the borrowers who are in danger of losing their home have likely been experiencing chronic stress for months, if not years.[69] Sometimes they view foreclosure as a form of losing face within their extended family, or sometimes they dread leaving a community where they are deeply rooted in the school, church, or neighborhood. They often have a strong emotional attachment to their house and are willing to make payments on an underwater mortgage in order to keep their home. The opposing party may be a low level employee of the lender, who has very little at stake in the dispute and may even participate by telephone. This lender representative will encounter significantly fewer stressors, only hearing voices and not meeting face-to-face with an adversary. The inexperienced borrower encounters more

[68] One of the co-authors (JST) conducted a mediation between three real estate partners who wanted to break up their partnership and move on with separate deals. At the start, in joint session, each partner was consumed by anger for what the others had done to him. This anger, evidenced by shouting and *ad hominem* attacks on each other, undoubtedly triggered their stress responses. Later, the mediator broke into separate caucus sessions and reframed the discussion from how each partner had been wronged, to what they each wanted to accomplish. They all had time to calm down during these caucuses and they all started to generate ideas on how to move forward. Acknowledging anger and frustration may have helped to reduce the stressors, and the passage of time allows the physiologic response to diminish, making it easier for each party to shift into the present. Additionally, the mediator adjourned the mediation for several days to allow the partners to formulate proposals. This further separated the high-stress opening session from the later decision-making.

[69] *See generally* Ariane Prohaska & Bronwen Lichtenstein, *Losing a Home to Mortgage Foreclosure: Temporary Setback or Chronic Stressor?*, 40 SOC. JUST. 65 (2014); Janet Currie & Erdal Tekin, *Is the Foreclosure Crisis Making Us Sick?*, (Nat'l Bureau of Econ. Research, Working Paper No. 17310, 2011). *See also* Selye, *supra* note 22 (for a discussion of "chronic stress").

stressors, and typically greater stakes. When stress levels are very different, it is appropriate for the mediator to concentrate stress reduction techniques on the party that is most likely to be affected by stress.

In a typical commercial mediation both parties may be subject to similar stressors, and their attorneys will also experience their own stressors. Attorneys usually do not have the same strong emotional attachment to the dispute, but they may have other stress triggers arising from demonstrating their effectiveness in front of clients and colleagues, as well as from financial concerns. Mediators who are aware of potential stress triggers for the attorney can take steps to minimize the attorney's stress response by directly addressing the attorney in a private conversation[70] or engaging the attorney as an authority figure in assessing litigation risks or just by simple stroking, "your attorney made excellent points in her opening statement earlier today."

IV. TECHNIQUES FOR REGULATING THE STRESS RESPONSES DURING MEDIATION

A. *Specific Techniques*

Mediators already have many tools in their toolbox for facilitating an effective mediation: building trust and rapport with the parties, increasing the parties' sense of control, modeling calm behavior to all participants, and using their neutral status to enhance negotiations. These tools are validated by specific knowledge of the physiological stress response and its triggers; the biological data explain why many traditional techniques work. Moreover, understanding how stressors trigger the stress response suggests new techniques that may also be potent tools, such as acknowledging and normalizing stress in the context of mediation. On the other hand, stress research suggests that some other traditional tools, such as encouraging emotional venting, may not be as effective as is traditionally thought, and can even be counterproductive.

[70] *See* Tracy Allen, *Cookie Monster*, *in* LOVE, STORIES MEDIATORS TELL 101 (Eric Galton & Lela Love eds., 2012) (Allen reflects at the end of the story that as the mediator, she had "lost sight of Tom [an attorney in the story who arrives late and is uncooperative] as a person, who was clearly in an agitated state. Rather than address that situation, I tried to ram my process at him and his client and met resistance from the outset.")

1. *Building Trust and Rapport*

The stress response is triggered when threats and demands are large enough to outweigh the supports and resources for handling them.[71] A mediator that is not perceived as threatening[72] is less likely to contribute to the stressor, and be perceived instead as a major resource and social support for the parties, which will attenuate the physiological stress response.[73] Moreover, when the mediator eventually has to reality test a party by asking a potentially threatening question, such as "Why do you think you will prevail in court?" the threat of such questions will be reduced if it comes from a mediator that the party trusts, if they feel respected and understood, and if they believe the mediator is committed to a fair process.[74] Mediation research has also found that the core element of mediator success for both attorneys and parties is the "mediator's ability to establish a relationship of trust and confidence with the disputing parties."[75]

To these ends, mediators normally work to build trust and rapport from the first interaction with attorneys and clients. Using small talk in phone conversations or in casual conversations before the formal mediation process

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[71] *See generally* SELYE, *supra* note 2; Bruce S. McEwen, *60 Years of Neuroendocrinology: Redefining Neuroendocrinology: Stress, Sex and Cognitive and Emotional Regulation*, 226 ENDOCRINOLOGY 67 (2015).

[72] *See generally* Beatrice de Gelder, *Towards The Neurobiology Of Emotional Body Language*, 7 NAT'L REV. NEUROSCIENCE 242 (2006).

[73] *See generally* Naomi I. Eisenberger et al., *Neural Pathways Link Social Support to Attenuated Neuroendocrine Stress Responses*, 35 NEUROIMAGE 1601 (2007); Camelia E. Hostinar & Megan R. Gunnar, *Social Support Can Buffer Against Stress and Shape Brain Activity*, 6 AJOB NEUROSCIENCE 34 (2015).

[74] *See generally*, JanA. Hausser, Andrea Mojzisch & Stefan Schulz-Hardt, *Endocrinological and Psychological Responses to Job Stressors: An Experimental Test of the Job Demand--Control Model*, 36 PSYCHONEUROENDOCRINOLOGY. 1021 (2011); I. Mitchell et al., *Stressors, Social Support, and Tests of the Buffering Hypothesis: Effects on Psychological Responses of Injured Athletes*, 19 BRIT. J. HEALTH PSYCHOL. 486 (2014); Aoife O'Donovan & Brian Hughes, *Social Support and Loneliness in College Students: Effects on Pulse Pressure Reactivity to Acute Stress*, 19 INT'L. J. ADOLESCENT MED. HEALTH 523 (2007); Jürgen Wegge, Sebastian C. Schuh & Rolf van Dick, *'I Feel Bad', 'We Feel Good'?--Emotions as a Driver for Personal and Organizational Identity and Organizational Identification as a Resource for Serving Unfriendly Customers*, 28 STRESS HEALTH 123 (2011).

[75] *See generally* Stephen B. Goldberg & Margaret L. Shaw, *Further Investigation Into The Secrets of Successful and Unsuccessful Mediators*, ALTERNATIVES TO HIGH COST LITIG. (Int'l Inst. for Conflict Prevention & Res.), Sept. 2008, at 159. *See also* LAURENCE BOULLE ET AL., MEDIATION: SKILLS AND TECHNIQUES 50 (2008); Jean Poitras, *What Makes Parties Trust Mediators?*, 25 NEGOT. J. 307 (2009).

begins can start to build rapport between the mediator and the participants.[76] Active listening skills help build trust and reduce the chance that unfamiliar mediation proceedings will trigger stress responses.[77] Open body language, open palm gestures, and leaning in toward a party can all have a non-verbal impact on a party, increasing their trust.[78] Subtle mimicry, such as mirroring body position, can also increase rapport, although this could backfire if it is too frequent or the party becomes aware of the behavior and perceives it as manipulation.[79] In addition, mediators can build trust by establishing their competence, particularly by demonstrating their experience as a mediator and their expertise in the mediation process.[80]

Mediators can incorporate these trust builders throughout the process, but special emphasis should be placed on developing trust as early as possible. This should start with the earliest contact between the mediator and the parties. Sometimes mediators have an opportunity to speak or meet with parties prior to the mediation, and trust can begin to build in these contexts. More typically, mediators first meet parties on the day of the mediation and in these cases mediators should meet at least briefly in caucus with each side to have an opportunity to begin the trust building process. "Early caucus" is used in this paper to describe a caucus that occurs before an opening joint session and gives the mediator an opportunity to greet the parties, engage in small talk, and begin to establish expertise and answer questions about the process. All of this can help build trust between the mediator and the party. Early caucus allows the mediator to sit down with each party separately and ask a series of questions to help determine their current state of mind, their goals for the mediation session, their understanding of the mediation process, and (in parenting cases) screen for domestic abuse.

2. *Increasing A Sense of Control*

Helping the parties feel a sense of control also reduces the perception that mediation events are threats and stressors, counteracting the stress response.[81] Mediators can emphasize throughout the process that the parties

[76] DWIGHT GOLANN & JAY FOLBERG, MEDIATION: THE ROLES OF ADVOCATE AND NEUTRAL 136 (Wolters Kluwer 2nd ed. 2011).
[77] *Id*. at 52; BOULLE ET AL., *supra* note 75, at 51.
[78] COOLEY, *supra* note 65, at 103.
[79] *See generally* N. Pontus Leander, Tanya L. Chartrand & John A. Bargh, *You Give Me the Chills: Embodied Reactions to Inappropriate Amounts of Behavioral Mimicry*, 23 PSYCHOL. SCI. 772 (2012).
[80] *See* Poitras, *supra* note 75, at 323.
[81] *See generally* COOLEY, *supra* note 65, at 146; Danny G. Kaloupek, Hann White &

are the ultimate decision makers in mediation and have final control of the outcome; self-determination is, after all, the first standard in the Model Standards of Conduct for Mediators.[82] Helping parties to have a clear understanding of the mediation process can reduce fear of the unknown.[83] Mediators can use written communications, phone calls, or early caucus sessions to explain the process.

Parties can also feel more in control if they know what to expect as the mediation moves forward and are invited to help set the agenda and indicate when they need a break. Parties respond positively when the mediator treats them with respect and offers them a chance to tell their story. Research has shown that parties generally have a favorable response to mediation, feel they have been treated fairly, and would use the process again.[84]

3. *Modeling Calm Behavior*

Mood and emotions are contagious[85] and throughout the mediation process the demeanor of the mediator helps set the tone for the discussions among all parties, including the attorneys. Sometimes the atmosphere is intense. Attorneys or parties speak rapidly, argue, and use technical jargon and an aggressive or threatening tone of voice, which are all emotional and

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May Wong, *Multiple Assessment of Coping Strategies Used by Volunteer Blood Donors: Implications for Preparatory Training*, 7 J. BEHAV. MED. 35 (1984); Danny G. Kaloupek & Tina Stoupakis, *Coping With a Stressful Medical Procedure: Further Investigation With Volunteer Blood Donors*, 8 J. BEHAV. MED. 131 (1985); Vicki R. LeBlanc et al., *The Relationship Between Coping Styles, Performance, and Responses to Stressful Scenarios in Police Recruits*, 15 INT. J. STRESS MANAG. 76 (2008).

[82] AMERICAN ARBITRATION ASSOCIATION AMERICAN BAR ASSOCIATION, ASSOCIATION FOR CONFLICT RESOLUTION, MODEL STANDARDS OF CONDUCT FOR MEDIATORS, Standard 1.A (2005). While mediators are aware of the importance of self-determination, parties often have little idea of who has ultimate decision making authority in mediation. *See* Nancy A. Welsh, *Disputants' Decision Control in Court-Connected Mediation: A Hollow Promise Without Procedural Justice*, 2002 J. DISP. RESOL. 179, 183 (2002).

[83] JEAN STERNLIGHT ET AL., MEDIATION THEORY AND PRACTICE 113 (2006).

[84] *See generally* John Lande, *Commentary: Focusing On Program Design Issues In Future Research On Court-Connected Mediation*, 22 CONFLICT RESOL. Q. 89 (2004); Roselle L. Wissler, *The Effectiveness of Court-Connected Dispute Resolution in Civil Cases*, 22 CONFLICT RESOL. Q. 55 (2004); Lisa B. Bingham, *Employment Dispute Resolution: The Case for Mediation*, 22 CONFLICT RESOL. Q. 145 (2004).

[85] *See generally* Ronlad Neumann & Fritz Strack, *"Mood Contagion": The Automatic Transfer of Mood Between Persons*, 79 J. PERSONALITY & SOC. PSYCHOL. 211 (2000); Marco Tamietto & Beatrice de Gelder, *Neural Bases of the Non-Conscious Perception of Emotional Signals*, 11 NAT'L REV. NEUROSCIENCE 697 (2010).

social stressors.[86] The mediator's actions can be a calming countermeasure, effective in reducing the threating speech and demeanor that are stressors during the mediation.[87]

Not only is the mediator in a position to neutralize the threat of such behavior by remaining calm, but also to model for the parties and attorneys how to slow down and reduce the frequency and magnitude of these stress triggers. In the case of co-mediation, mediators can directly model calm conversation and process related decision-making between themselves in full view of the parties. The mediator(s) can speak softly and slowly, adjust body position to communicate calm acceptance and modulate their eye contact with the parties.[88] This modeling can occur throughout the process, beginning with early caucus and in the mediator's opening statement. Through social contagion the parties are likely to mirror this calm behavior, often without being aware they are doing so.[89]

4. *Acknowledge and Normalize Stressors*

Just as mediators learn to acknowledge emotions in general, they can also acknowledge those negative emotional events common during mediation that can be emotional stressors triggering the physiological stress response.[90] Some emotional stressors during mediation may include reliving a traumatic event that led to the mediation, the threat of being in an unfamiliar process, speaking in front of an adversary, and fear of losing either monetary or social status.[91] By naming these common emotional stressors, the mediator can help reduce the stress response, particularly those involving the amygdala, which processes anger and fear stimuli.[92] Discussing potential stressors may

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[86] Christianson, *supra* note 30.
[87] BOULLE ET AL., *supra* note 75, at 52.
[88] In the context of trying to persuade people to change their minds, direct eye contact is actually dissuasive, reducing the chance that the listener will change their mind. In some cultures, it can also be threatening. Frances S. Chen et al., *In the Eye of the Beholder: Eye Contact Increases Resistance to Persuasion*, 24 PSYCHOL. SCI. 2254, 2259 (2013).
[89] *See generally* Tanya L. Chartrand & John A. Bargh, *The Chameleon Effect: The Perception-Behavior Link and Social Interaction*, 76 J. PERSONALITY AND SOC. PSYCHOL. 893 (1999).
[90] *See generally* Christianson, *supra* note 30.
[91] *See generally* Dickerson & Kemeny, *supra* note 9; Coates & Herbert, *supra* note 10; LeBlanc, *supra* note 10; Selye, *supra* note 22, at 32; Taylor, *supra* note 22, at 40; Kemeny, *supra* note 24.
[92] Rodrigues et al., *supra* note 44; Uwe Herwig et al., *Self-Related Awareness and Emotion Regulation*, 50 NEUROIMAGE 734, 734 (2010); Matthew D. Lieberman et al., *Putting Feelings into Words: Affect Labeling Disrupts Amygdala Activity in Response to*

help to normalize them, as well as help parties access their own mechanisms for coping with stressors.[93]

5. *Using Neutral Status*

As we have seen, high cortisol levels enhance the perception of anger. Mediators can use their neutral status to offset some of this effect.[94] Mediators have long recognized the impact of psychological barriers to settlement, including reactive devaluation.[95] This heuristic holds that a party will devalue an offer that comes from an adversary.[96] High cortisol levels will magnify this problem, but mediators can counteract its impact by accepting the role of neutral presenter.[97] Options developed in caucus with one of the parties can be transmitted to the other party as a suggestion from the mediator rather than as originating from the opposing party.[98]

6. *Managing Venting*

The Merriam-Webster dictionary defines the verb "vent" as: "To express (an emotion) usually in a loud or angry manner."[99] The benefits of venting permeate our culture, revealed by idioms such as "get it off your chest," "clear the air," or "lance the boil."

Affective Stimuli., 18 PSYCHOL. SCI. 421, 421 (2007). *See generally* LeDoux, *supra* note 29; Makino et al., *supra* note 29.

[93] One of the co-authors (JST) altered her opening statement for foreclosure mediations to add a short statement directed specifically at the borrowers acknowledging that they were facing the possible loss of their home and this was a very stressful event for most people. They are reassured that they will be given an opportunity to ask questions during the mediation. The response is often quite dramatic. Rather than sitting with eyes cast down and looking like they want to withdraw from the mediation, most parties start to make direct eye contact and become more engaged in the mediation session.

[94] *See generally* Dickerson & Kemeny, *supra* note 9; Kemeny, *supra* note 24; Dhabhar, *supra* note 26.

[95] GOLANN & FOLBERG, *supra* note 76, at 192; KIMBERLEE K. KOVACH, MEDIATION: PRINCIPLES AND PRACTICE 206 (3d ed. 2004).

[96] JENNIFER ROBBENNOLT & JEAN STERNLIGHT, PSYCHOLOGY FOR LAWYERS: UNDERSTANDING THE HUMAN FACTORS IN NEGOTIATION, LITIGATION, AND DECISION MAKING 96-97 (2012).

[97] Hoffman & Wolman, *supra* note 1, at 791.

[98] GOLANN & FOLBERG, *supra* note 76, at 160.

[99] *Vent*, MERRIAM-WEBSTER ONLINE DICTIONARY (2003), http://www.merriam-webster.com/dictionary/vent (last visited January 22, 2016).

Mediation training has long viewed "venting" anger as a useful tool for restoring a positive psychological state. This practice was advocated in *Getting to Yes* by Fisher and Ury,[100] the source of many concepts in interest-based negotiation and mediation, and has been handed down as received wisdom through several generations of mediation trainers, practitioners, and theorists. Golann and Folberg[101] say, "simply allowing the disputants to vent their feelings directly to each other or privately to the mediator is enough to clear the air," and Kovach[102] emphasizes that venting emotions is necessary to resolve some disputes.

Venting can be useful if it reveals new information or gives parties a sense of procedural justice. Venting reveals information in a number of ways. Fisher and Shapiro suggest that it can be useful to educate others about the impact of their behavior, to influence others, and to improve relationships. [103] Many disputes that are framed entirely in monetary terms also have emotional components that underlie the opening positions. New information gleaned as a result of venting is important in uncovering these emotional needs and can be used to develop non-monetary options for settlement.[104] Venting to educate and influence others is most effective when the information is new, such as when the parties have not opened up to each other before the mediation.[105] Conversely, it is least effective when it is a rehash of accusations and anger that the parties have gone over many times before, as is often the case in divorce mediation.[106]

Venting can also give parties a sense of procedural justice when it allows a party to feel they have had a voice in the process.[107] Mediation parties often indicate they value the opportunity to be heard in mediation,[108] and it is

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[100] ROGER FISHER & WILLIAM URY, GETTING TO YES: NEGOTIATING AGREEMENT WITHOUT GIVING IN 31 (Bruce Patton ed., 2d ed. 1981) ("Often, one effective way to deal with people's anger, frustration, and other negative emotions is to help them release those feelings. People obtain psychological release through the simple process of recounting their grievances.").

[101] GOLANN & FOLBERG, *supra* note 76, at 179.

[102] KOVACH, *supra* note 95, at 36.

[103] ROGER FISHER & DANIEL SHAPIRO, BEYOND REASON: USING EMOTIONS AS YOU NEGOTIATE 156 (2005).

[104] Birke, *supra* note 1, at 510.

[105] FISHER & SHAPIRO, *supra* note 103, at 160.

[106] *See generally* John M. Haynes, *Mediating with a Powerful/Competitive Couple: Michael and Debbie*, 1987 J. DISP. RESOL. 27 (1987).

[107] Welsh, *supra* note 82, at 187.

[108] Chris Guthrie & James Levin, *A "Party Satisfaction" Perspective on a Comprehensive Mediation Statute*, 13 OHIO ST. J. ON DISP. RESOL. 885, 891 (1998); Roselle L. Wissler, *Mediation and Adjudication in the Small Claims Court: The Effects of Process and Case Characteristics*, 29 L. & SOC'Y REV. 323, 345 (1995).

not unreasonable to assume that venting, along with active listening and acknowledgement by the mediator, is part of the process that results in this positive reaction. Examples of this frequently occur in the foreclosure mediation program where one of the co-authors (JST) mediates. Although parties may lose their homes, they still fill out evaluation forms indicating the mediation process itself was valuable and fair. This may happen when parties have had an opportunity to tell their story to the mediator and to the lender and feel they have finally been heard.

Nonetheless, venting negative emotions can be a powerful stressor and can increase cortisol levels.[109] As we discussed above in Part III, higher cortisol levels may lead to distortions in how we perceive anger, thus making decision-making much more difficult and making parties more entrenched in their original positions. Moreover, there is recent psychological research demonstrating that venting does not necessarily reduce anger and "clear the air" as mediators have long believed, but rather has the opposite effect of increasing aggression.[110] Stressed men, especially, become cognitively rigid and entrenched in their positions. [111]

Venting, therefore, is a risky venture. Not only does it act as a stressor, but it has been shown to increase anger levels.[112] Mediators need to be very cautious in encouraging venting in order to minimize the risk of creating a new stressor or intensifying a party's anger. There are some steps mediators can take to allow venting while minimizing risk. When parties come into mediation very angry and want to tell their story, it is appropriate to allow them to voice their concerns, but it is best to have that happen in caucus. Starting the mediation session with brief caucuses before joint sessions gives mediators an opportunity to gauge the emotional level of each party and gives parties an opportunity to immediately voice their concerns. Doing this in caucus may minimize the risk of promoting anger in the opposing party and will give the venting party maximum time to recover before reaching the decision-making stage of the mediation process. If the mediator believes the venting has uncovered useful information, the mediator has time to set up further discussions in joint session that will reveal the new information while minimizing emotional distress.

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[109] *See generally* Dickerson & Kemeny, *supra* note 9.

[110] Brad J. Bushman, *Does Venting Anger Feed or Extinguish the Flame? Catharsis, Rumination, Distraction, Anger, and Aggressive Responding*, 28 PERSONALITY & SOC. PSYCHOL. BULL. 724, 725, 726, 729 (2002).

[111] *See generally* L. Tomova et al., *Is Stress Affecting Our Ability to Tune into Others? Evidence For Gender Differences in the Effects of Stress on Self-Other Distinction*, 43 PSYCHONEUROENDOCRINOLOGY 95 (2014).

[112] *See generally* Bushman, *supra* note 110.

Also, mediators should be cautious about probing strong emotions and should try to distance the party from the events about which they are venting. This may be accomplished through the following two methods: first, by focusing on the emotions present at the time of the mediation rather than asking about emotional responses in the past, and second, by asking parties to tell their stories from a third party perspective, almost as if they are watching a movie unfold.[113] Mediators should not encourage parties to relive negative events that started a conflict or ask parties to share how they felt when the other party made them angry, as these strategies may be more likely to trigger a stress response leading to greater entrenchment in the party's position. When there are strong emotions at the time conflict began, mediators can minimize the impact of discussing these emotions by framing questions as, "Why do you think you reacted so strongly?"[114]

B. *Modifying The Structure of Mediation*

Modifying the timing and order of stages in mediation can reduce the risks of a stress response. Ideally, parties should have sufficient time for cortisol levels to diminish following a stressful start to a mediation and reach a more optimal level before moving on to decision-making activities. This may be accomplished in the following ways:

- By starting the mediation with brief caucus sessions on the day of the mediation or in advance;
- By spending enough time in caucus after joint session for cortisol to diminish (at least thirty to forty-five minutes); or
- By delaying decision-making activities for at least a day by scheduling a second mediation session or reaching settlement through a mediator's final proposal or post-mediation negotiations.

Each mediation involves a unique combination of personalities, issues, and emotions, and each mediation should be designed to respond to these unique characteristics. Some tools may be useful generally in most mediations and some should be used more selectively. We discuss the

[113] Ethan Kross et al., *When Asking "Why" Does Not Hurt*, 16 PSYCHOL. SCI. 709, 710 (2005).
[114] *Id.*

general stages of mediation below and point out how these tools can be employed.

1. *Starting with Early Caucus*

Facilitative mediations traditionally begin with a joint session where the mediator presents an opening statement to all participants and each side presents their own opening statement. The premise has been that joint sessions permit parties to hear the strongest arguments by the other side and allow mediators to point out underlying interests of both sides. Recently, though, many attorneys have objected to joint sessions and encouraged mediators to conduct mediations primarily or exclusively through individual caucus sessions.[115] Many commercial advocates believe nothing is gained through joint sessions while there is a risk that high emotions may polarize the parties and sabotage the session.[116]

One answer to these criticisms may be to reduce the risk of heightened emotions in joint sessions by starting the mediation process with separate caucuses prior to joint sessions. Early caucuses may give the mediator an opportunity to build trust and rapport with the parties in a less adversarial setting. As we have discussed, building trust may help minimize stress triggers by giving parties additional resources to deal with the dispute as it unfolds.[117] Early caucuses also give the mediator an opportunity to talk about process and answer questions, giving parties a stronger sense of control, which may reduce stress triggers. Finally, if a party wants to talk about highly emotional issues, doing so in caucus may serve to separate a potential stress trigger from joint sessions and later decision-making sessions. This gives time for built-up cortisol to diminish to the "sweet spot" where attention is focused but decision-making ability is not impaired.[118] In highly emotional situations, individual caucus meetings can be conducted before joint sessions to allow stress associated with these sessions to dissipate before proceeding to a decision-making phase.[119]

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[115] *See generally* Eric Galton & Tracy Allen, *Don't Torch the Joint Session*, 21 DISP. RESOL. MAG. 25 (2014).

[116] *See generally* Lynne S. Bassis, *Face-to-Face Sessions Fade Away: Why Is Mediation's Joint Session Disappearing?*, 21 DISP. RESOL. MAG. 30 (2014).

[117] *See infra* Part II.A.3.

[118] One of the authors (JST) is presently conducting a pilot program at the Center for Conflict Resolution in Chicago to assess the usefulness of an early caucus within a formal facilitative model.

[119] GOLANN AND FOLBERG, *supra* note 76, at 98. (Describing the "Death of a Student" at MIT where the mediator, Jeffrey Stern, met with the parents and their counsel separately

2. *The Mediator's Opening Statement*

The mediator's opening statement provides an excellent opportunity to incorporate many stress reduction techniques. Mediators usually have full control of the room during their opening statement and can easily model calm discussion by modulating voice patterns. Mediators have an opportunity to make moderately-frequent eye contact and use open body positions while delivering the opening statement.[120] Mediators should include information on the process and self-determination in the opening statement. Mediators can also use the opening statement as an opportunity to acknowledge and normalize potential stress triggers. In short, the opening statement gives the mediator an opportunity to counteract stress triggers by attenuating their magnitude and increasing the amount of time between them to prevent the physiological stress responses from cumulatively building and creating high sustained levels of stress hormones.[121]

3. *Caucus Order*

After a stress-inducing joint session, cortisol levels can be high and parties may misinterpret signals from the other side. There may be several factors in deciding which party to caucus with first. Does one party need time to recover before moving forward? Can the mediator help provide a calm environment in caucus to start the recovery process? Will a party benefit from a low-stress caucus followed by waiting time?

Mediators should consider the impact of stress response when choosing which party to caucus with first after a joint session. Mediators must make a choice if there have been high levels of emotion or if there are indications that either party is highly stressed, based on body language, speech patterns, or demeanor. They can start by caucusing with the party who appears to be experiencing more stress and utilizing the calmer atmosphere of a caucus session in an attempt to help the party regain composure by using active listening skills, acknowledging emotions, and reassuring the party that they continue to have control of the situation. Alternatively, the mediator may begin by caucusing with the seemingly less stressed party to give the more

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at a breakfast before the joint session where the parents had an opportunity to express their anger).

[120] COOLEY, *supra* note 65, at 64.

[121] *See generally* Selye, *supra* note 22; Taylor, *supra* note 22; Tsigos & Chrousos, *supra* note 13.

stressed party an opportunity to use their own resources to deal with the stressor. In this case, the simple passage of time, without additional stress triggers, may allow cortisol levels to decrease.

Mediators need to use their judgment to determine which course of action will be most useful in a given situation. In part, this will depend on how much trust the mediator has accumulated with the more stressed party. The mediator can be a resource to parties who trust them and can use separate caucuses to de-escalate heightened emotions. On the other hand, a caucus with a party who does not yet trust the mediator may increase the stress triggers and exacerbate the problem.

V. RECOGNIZING THE STRESS RESPONSE

Ideally, mediators could easily detect when the parties are stressed or not and modify their approach accordingly. A wider pupil is an indicator of increased adrenalin levels (sympathetic nervous system arousal), but the increase in pupil diameter is very small (< 0.5 mm); less than moving from bright into dim light. [122] There are no visible indicators of the cortisol response and people are notoriously inaccurate at reporting their level of physiological stress (see Part II.A.2. above). Even if people were good at knowing when they are in a stressed hormonal state, men are less likely than women to express negative emotional stressors; likewise, some cultures value being emotionally unexpressive.[123] Fortunately, we know how animals behave when they are stressed, and we find that their responses are remarkably consistent across species, suggesting that humans too show similar stress behaviors.[124] There are the following four distinct stress behaviors: fight, flight, freeze, and tend-and-befriend.

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[122] Kim L. Felmingham et al., *Eye Tracking and Physiological Reactivity to Threatening Stimuli in Posttraumatic Stress Disorder*, 25 J. ANXIETY DISORDERS 668, 672 (2011).

[123] Ann M. Kring & Albert H. Gordon, *Sex Differences in Emotion: Expression, Experience, and Physiology*, 74 J. PERSONALITY & SOC. PSYCHOL. 686, 690, 691 (1998); Hoin Kwon et al., *Cultural and Gender Differences in Emotion Regulation: Relation to Depression*, 27 COGNITION & EMOTION 769, 771 (2013). *See generally* Anna-Katharina Fladung & Markus Kiefer, *Keep Calm! Gender Differences in Mental Rotation Performance Are Modulated by Habitual Expressive Suppression*, PSYCHOL. RES. (2015).

[124] See generally CANNON, BODILY CHANGES IN PAIN, *supra* note 2; CANNON, THE WISDOM OF THE BODY, *supra* note 2; SELYE, *supra* note 2; Fink, *supra* note 2; McEwen, *supra* note 2; Nesse & Young, *supra* note 6; Overli et al., *supra* note 6; Adamo, *supra* note 7; Ottaviani & Franceschi, *supra* note 7; Chrousos, *supra* note 25; Dhabhar, *supra* note 26.

A. *Fight*

1. *Behavioral Response*

Stress triggers aggression and fighting, not just against a predator or a challenger, but also against a bystander, termed "displaced aggression." It is ubiquitous among vertebrates; trout will attack a smaller fish after being threatened by a larger one.[125] In people, verbal aggression may be triggered by stressors, including shouting, threatening, insulting, and shaming. Such fights need not be overtly dramatic, but instead can consist of "intention movements" or "microaggressions." A male baboon may simply "yawn," displaying its large incisors without a full aggressive display or attack; a stare is threatening not only among mammals, but also among birds, lizards and crabs.[126] Similarly, among people, microaggressions may be common in everyday life and be frequently experienced by people of color, women, or other minority groups.[127] For example, someone may assume that a person speaks a foreign language because of their race, or a woman's opinion may be ignored in a discussion because of her gender. Cumulatively, these become significant stressors for the recipient, having similar effects as overt physical or social aggression.

2. *Behavioral Expression During Mediation*

In mediation, fight behavior is obvious when one or both parties (or attorneys) start shouting at each other. If the arguing is balanced and there are no signs of distress, mediators may permit the behavior to continue so that each side can see the impact of the conflict on the other party. However, mediators must be ready to step in and quickly move to caucus or adjourn the process if the shouting is unbalanced, one party is more aggressive than the other, or any participant appears uncomfortable. A strong negative emotional response may trigger a stress response. The opportunities for each party to observe the impact of the dispute on their opponent and revealing

[125] *See generally* Øyvind Øverli et al., *Behavioral and Neuroendocrine Correlates of Displaced Aggression in Trout*, 45 HORMONES & BEHAV. 324 (2004).
[126] Ned H. Kalin, *The Neurobiology of Fear*, 268 SCI. AM. 94, 95, 96 (1993) (discussing the reason mediators need to regulate their eye contact; too much becomes irritating if not threatening). *See also* Leander, Chartrand & Bargh, *supra* note 79.
[127] Kevin L. Nadal, *The Racial and Ethnic Microaggressions Scale (REMS): Construction, Reliability, and Validity*, 58 J. COUNSELING PSYCHOL. 470, 471 (2011).

new information need to be balanced against the danger of an increased stress response and associated cortisol increase.

Conventional wisdom in mediation has encouraged, or at least permitted, venting of strong emotions under the theory that venting or "blowing off steam" will help parties refocus on solutions in a calmer frame of mind. Research regarding venting shows just the opposite; venting increases anger.[128] Less dramatic aggressive behavior is also common in mediation. Microaggressions may be displayed by facial expression, body position, tone of voice, sarcasm, or in other subtle ways.[129]

Mediators need to be attuned to these subtle displays and intervene when it seems to be appropriate. Interventions can include: probing for distress in joint session or caucus, acknowledging and normalizing stressors, modeling calm behavior, and active listening.

B. *Flight*

1. *Behavioral Response*

Fleeing is the second classic stress behavior: running, flying or swimming away from a threat. Animals also show subtle intention movements of flight.[130] Threatened robins bow several times in a row, only the very beginning of the movements they need to take flight. Stressed willow warblers feeding on the ground, instead of their customary trees and bushes, flutter their wings while continuing to feed. Dogs wag their tails slightly when contemplating running.[131] Humans too have intention behaviors signaling their desire to flee, such as restless legs, tapping feet,

[128] Brad J. Bushman et al., *Chewing on It Can Chew You up: Effects of Rumination on Triggered Displaced Aggression*, 88 J. PERSONALITY & SOC. PSYCHOL. 969, 974 (2005); Tammy Lenski, *Venting Anger : A Good Habit to Break,* MEDIATE.COM, http://www.mediate.com/articles/LenskiTbl20110516.cfm (last visited Jan. 22, 2016). *See, e.g.* Dominik Mischkowski et al., *Flies on the Wall Are Less Aggressive: Self-Distancing "in the Heat of the Moment" Reduces Aggressive Thoughts, Angry Feelings and Aggressive Behavior*, 48 J. EXPERIMENTAL SOC. PSYCHOL. 1187, 1187-91 (2012). *See generally* Kenneth F. Dunham, *I Hate You, But We Can Work It Out: Dealing with Anger Issues in Mediation*, 12 APPALACH. J. L. 191 (2013).

[129] Nadal, *supra* note 127, at 471.

[130] A. Daanje, *On Locomotory Movements in Birds and the Intention Movements Derived From Them*, 3 BEHAVIOUR 48 (1951).

[131] *Id.*

wide darting eyes, and fidgeting.[132] The decision whether to fight, flee, or choose a different stress behavior is mediated by the habenula,[133] which contributes to decision-making particularly when it is based on deeply held values rather than pragmatics.[134]

2. *Behavioral Expression During Mediation*

Mediation parties can express flight behavior overtly when they suddenly stand up and start to walk out of the room. Sometimes mediators can intervene and keep the process going by engaging the party who wants to leave or by moving to caucus. Parties who are ready to leave may be persuaded to stay by a mediator who has built up a reserve of trust.[135]

Less overt behaviors also signal the flight response: restlessness, fidgeting, and darting eyes are described above. Mediators should be attuned to these behaviors and intervene with a move from joint session to caucus or appropriate questions. Mediators can invite a restless party to join into a discussion or simply ask the party if they have any questions.

C. *Freeze*

1. *Behavioral Response*

Freezing is a particularly adaptive response to stressors if an animal has good camouflage matching their background; stationary objects are harder for predators to see than moving ones. The motionless winter ptarmigan is almost undetectable against snow and dark branches; a threatened American bittern stands with its long thin beak pointed vertically up at the sky, exposing the vertical stripes on its breast, which together blend the bird with

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[132] Manitoba Trauma Information and Education Centre, *Fight, Flight, Freeze Responses* (Dec. 12, 2015), http://trauma-recovery.ca/impact-effects-of-trauma/fight-flight-freeze-responses/ (last visited Jan. 22, 2016).

[133] The habenula is a highly conserved part of the brain across vertebrates, with inputs from the hippocampus (memory) and hypothalamus (stress regulation).

[134] O. Hikosaka, *The Habenula: From Stress Evasion to Value-Based Decision-Making*, 11 NAT. REV. NEUROSCI. 503 (2010).

[135] In the first day of a multi-day probate mediation between adult siblings, the sister did not want to participate and tried to just give the mediator (one of the co-authors, JST) a list of items she wanted and leave the room. The mediator was able to keep her in the room by focusing immediately on what she wanted to accomplish, pointing out how she could accomplish her goals. The mediation ended with a successful division of the estate assets, although it took nine full-day sessions spread over several months.

the reeds at the water's edge. Although motionless, the animal is nonetheless surveying its environment, hypervigilant for threats. These primary motor reactions are direct autonomic responses activated via connections between the amygdala and the brainstem.[136] People also freeze via similar neural mechanisms.[137] They too become motionless, reporting that they their limbs feel stuck, heavy, or still.[138] They hold their breath, breathing shallowly, while their heart pounds slowly and they orient towards the threat.[139]

2. *Behavioral Expression During Mediation*

The freeze response can be hard to see in the mediation setting when a client has an attorney who does most of the speaking. The challenge is to distinguish a frozen client who cannot talk from someone who is silent because the attorney does not want the client to speak. This uncertainty is most likely to occur in joint session. Mediators can wait and see if the freeze response diminishes as the party becomes more acclimated to the process and as trust and rapport with the mediator continues to increase. If not, the mediator can give parties who appear frozen a small concrete task, such as asking them to clarify what someone has just said. If in joint session, going to caucus may be an effective way to probe further and talk directly to the party.

D. *Tend-and-Befriend*

1. *Behavioral Response*

Stress behaviors can also be social. The stress response "tend-and-befriend" was first formally recognized among women, building on its occurrence in non-human animals.[140] Related to the attachment-caregiving systems, it involves both nurturing and comforting others as well as establishing or strengthening social networks, which can widen resources to

[136] JOSEPH E. LEDOUX, SYNAPTIC SELF : HOW OUR BRAINS BECOME WHO WE ARE (2002); Edmund T. Rolls, *Precis of the Brain and Emotion*, 23 BEHAVIOURAL & BRAIN SCI. 177 (2000).
[137] Karin Roelofs, Muriel A. Hagenaars & John Stins, *Facing Freeze: Social Threat Induces Bodily Freeze in Humans*, 21 PSYCHOL. SCI. 1575 (2010).
[138] Norman B. Schmidt et al., *Exploring Human Freeze Responses to a Threat Stressor*, 39 J BEHAVIORAL THERAPY & EXPERIMENTAL PSYCHIATRY 292–304 (2008).
[139] Manitoba Trauma Information and Education Centre, *supra* note 132.
[140] Shelley E. Taylor et al., *Biobehavioral Responses to Stress in Females: Tend-and-Befriend, Not Fight-or-Flight*, 107 PSYCHOL. REV. 411 (2000).

cope with the stressor. In animals, this stress behavior is often manifest by social touch and grooming, which stimulates release of the hormone oxytocin.[141] Oxytocin in turn enhances trust and reduces cortisol.[142]

Men are less likely to use tend-and-befriend unless they are stressed in a group setting, within which they have already created bonds that promote trust, trustworthiness, and helpfulness during social decision-making.[143] But when men are stressed alone, they do not share more or reciprocate during social decisions, and instead are less trustful and more punitive.[144] Thus, stressed women become more capable of empathy and alternative perspective-taking, facilitating the tend-and-befriend stress behavior, while stressed men become more egocentric and cognitively rigid.[145] Nonetheless, those men responding with the highest cortisol are more likely to report feeling bonded to each other.[146]

2. *Behavioral Expression During Mediation*

The most explicit form of tend-and-befriend is bringing a support person to the mediation session. Indeed, the Illinois Uniform Mediation Act expressly permits this.[147] The support person is often present throughout the mediation, but can aid a party even if the opponent objects to their presence and they only participate during caucus. In rare cases, a party may cope with the stress of conflict and mediation by offering support to their opponent. This can happen in divorce and custody mediation, and also in juvenile delinquency cases.[148]

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[141] Shota Okabe et al., *Activation of Hypothalamic Oxytocin Neurons Following Tactile Stimuli in Rats*, 600 NEUROSCIENCE LETTERS 22, 26 (2015).
[142] Vera Morhenn, Laura E. Beavin & Paul J. Zak, *Massage Increases Oxytocin and Reduces Adrenocorticotropin Hormone in Humans*, 18 ALTERATIVE THERAPIES HEALTH & MEDICINE 11, 17 (2012).
[143] Bernadette von Dawans et al., *The Social Dimension of Stress Reactivity: Acute Stress Increases Prosocial Behavior in Humans*, 23 PSYCHOL. SCI. 651, 658 (2012).
[144] Nikolaus Steinbeis et al., *The Effects of Stress and Affiliation on Social Decision-Making: Investigating the Tend-And-Befriend Pattern*, 62 PSYCHONEUROENDOCRINOLOGY 138 (2015).
[145] Tomova et al., *supra* note 111.
[146] Justus Berger et al., *Cortisol Modulates Men's Affiliative Responses to Acute Social Stress*, 63 PSYCHONEUROENDOCRINOLOGY 1 (2016).
[147] 710 ILCS § 35/10.
[148] In a juvenile case mediated by one of the co-authors (JST), a young teen had thrown a rock through a window in a park district building. It was the window of the park's security office and the police officer inside came out, caught, and arrested him. The arresting officer and the teen were opposing parties in the mediation. Over the course of the mediation, the officer became interested in setting up a way to have continued contact

VI. APPLYING NEUROSCIENCE OF STRESS TO THE MEDIATION SCENARIO

Let's go back to our hypothetical mediation scenario and see how we can apply the lessons learned from the neuroscience of conflict and stress to design and conduct a better process.

> The parties we met at the start of this paper, Morgan and Tina, had known each other for many years and are now fierce adversaries. The mediator reasonably expects emotions to run very high and many stressors to be present at the start of the mediation. The first step is to start the mediation with early caucus sessions with each party. In early caucus:
>
> - The parties acclimate to a new physical environment (counteracting a common stressor).
> - The mediator begins to build trust and rapport by starting a conversation with small talk and moving on to more substantive questions (building trust with the mediator gives parties more resources to counteract stressors).
> - The mediator asks each party how they are feeling about the mediation (not the precipitating problem) and gives them an opportunity to vent their anger and frustration if they so choose, giving both of them a sense of procedural justice. (Asking this question in early caucus means the most emotional questions may be handled early so that the party has time for cortisol levels to diminish before it is time to evaluate settlement options.)
> - The mediator asks each of the parties if they think that they will have difficulty controlling their temper when the joint

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with the teen. He wanted to try to steer him into park district activities and away from gang members. The more typical response to juvenile delinquency is anger and a desire for retribution. Here, the police officer had a tend-and-befriend response.

session begins and discusses techniques that might be useful to stay civil, such as taking deep breathes and writing down reactions instead of blurting them out (providing the parties with more resources to counteract stressors).

- The mediator acknowledges and normalizes any stressors that seem to be present (diminishing their effects).
- The mediator asks the parties if they have questions about the process (enhancing their feeling in control).
- The mediator also spends some time talking to the attorneys about how they plan to present their opening statements and discusses how their tone may impact the opposing party (reducing potential stress triggered by more adversarial presentations).

All of this work results in a much calmer opening joint session.

- The mediator gives a full opening statement (giving the parties time to acclimate to the room and the presence of their opponent).
- The mediator models calm discourse in the delivery of her opening statement (enhancing the parties' sense of control, and increasing calm behavior in the parties and their attorneys).
- The mediator emphasizes that mediation is about self-determination and the parties do not need to enter into agreement unless they are comfortable with all of the terms (enhancing the feeling of control).
- The attorneys present their opening statements in a less adversarial tone (minimizing stressors).

After these opening statements, the mediation continues in joint session where:

- The mediator asks a variety of questions in joint session without triggering hostilities (the parties have already had one

opportunity to vent and to feel heard in early caucus).

- Although there are some angry words exchanged, each party learns about the other side's specific accusations (venting provides information).
- During this joint session, the mediator notices Tina appears restless and is fidgeting with a pen (sometimes indicative of flight behavior).

The mediator soon ends the joint session and caucuses first with Tina and her attorney:

- The mediator asks Tina how things are going and acknowledges that meeting directly with an adversary can be stressful (acknowledging and normalizing stressors).
- Tina says she thinks the mediation is a waste of time because Morgan just wants to sell (misremembering some of Morgan's more conciliatory statements in joint session).
- The mediator reminds Tina what Morgan said that indicates she might be willing to compromise (counteracting the tendency to misremember under high stress and relying on the trust built up between Tina and the mediator earlier in the mediation).

The mediation continues with several rounds of caucus where the mediator develops and reality tests various options. As the day goes on, the mediator notices that the parties are beginning to lose focus. In a joint session to discuss the options on the table:

- The mediator reminds everyone that one of the parties must leave no later than 5:00 pm (adding a mild stressor).
- The parties discuss the possible options and reach a settlement by 4:45 pm (moderate levels of cortisol from the time constraint helps focus attention and foster decision-making).

VII. CONCLUSIONS

This paper has presented a description of the physiologic stress response because understanding how stress hormones, particularly cortisol, affect the brain and the body can help mediators interpret behaviors that they see in parties and in attorneys. We have proposed a number of techniques for mediators to use in connection with this physiological stress response. Most techniques, such as building trust, promoting a sense of control, and modeling calm behavior have long been part of a mediator's toolbox but now have additional validation from the neuroscience of conflict and stress. Others, such as acknowledging and normalizing stressors, the risks of venting, and the importance of timing and sequence of the mediation session are new ideas that mediators can incorporate into their practice. Mediators can also use this knowledge to design the mediation process to minimize the effect of physiologic stress.

The art and skills of an experienced mediator will never be fully explained by neuroscience. Neuroscience will not reveal all of the inner workings of the minds of the participants, let alone the complexity of their interactions with each other during a mediation session. Nonetheless, our current understanding of the neuroscience of conflict and stress validates many of the techniques mediators have traditionally employed. Moreover, it suggests some new tools and new processes that can be powerful. Future work will focus on the role of emotions in mediation well as detailing individual differences based on the context of mediation, gender, and cultural identity.