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You Can't Out-Supplement Stress

The Importance of Resilience

By Alex Manos
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INTRODUCING ME

- IFMCP, MSc, BSc, NASM-CPT

- Co-founder of A.F.M.M.P
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- Co-founder of Healthpath:
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- CWO of Exhale Coffee
  - www.exhalecoffee.com

- Host of The Alex Manos Podcast And The Healthpath Podcast

OBJECTIVES

- What is stress? And what is its impact?
- Introducing a holistic approach to resiliency focusing on the mental, emotional, and spiritual.
- To (start to) create a resiliency framework that can be used to support both ourselves, and our communities.
- To provide practical and simple ways to both evaluate and enhance resilience.

You can’t stop the waves, but you can learn how to surf.

- Kabat-Zinn -

STRESS, CORTISOL RESISTANCE, INFLAMMATION

- Prolonged stressors result in GCR, which, in turn, interferes with appropriate regulation of inflammation. Because inflammation plays an important role in the onset and progression of a wide range of diseases, this model may have broad implications for understanding the role of stress in health.

Chronic stress, glucocorticoid receptor resistance, inflammation, and disease risk

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Edited* by Bruce S. McEwen, The Rockefeller University, New York, NY, and approved February 27, 2012 (received for review November 7, 2011)

We propose a model wherein chronic stress results in glucocorticoid receptor resistance (GCR) that, in turn, results in failure to down-regulate inflammatory response. Here we test the model in two viral-challenge studies. In study 1, we assessed stressful life events, GCR, and control variables including baseline antibody to the challenge virus, age, body mass index (BMI), season, race, sex, education, and virus type in 276 healthy adult volunteers. The volunteers were subsequently quarantined, exposed to one of two rhinoviruses, and followed for 5 d with nasal washes for viral isolation and assessment of signs/symptoms of a common cold. In study 2, we assessed the same control variables and GCR in 79 subjects who were subsequently exposed to a rhinovirus and monitored at baseline and for 5 d after viral challenge for the production of local (in nasal secretions) proinflammatory cytokines (IL-1β, TNF-α, and IL-6). Study 1: After covarying the control variables, those with recent exposure to a long-term threatening stressful experience demonstrated GCR; and those with GCR were at higher risk of subsequently developing a cold. Study 2: With the same controls used in study 1, greater GCR predicted the production of more local proinflammatory cytokines among infected subjects. These data provide support for a model suggesting that prolonged stressors result in GCR, which, in turn, interferes with appropriate regulation of inflammation. Because inflammation plays an important role in the onset and progression of a wide range of diseases, this model may have broad implications for understanding the role of stress in health.

lymphocytes | receptor sensitivity | psychological stress | cortisol | hypothalamic–pituitary–adrenocortical axis

Chronic psychological stress is associated with a greater risk of depression, cardiovascular disease (CVD), diabetes, autoimmune diseases, upper respiratory infections (URIs), and poorer wound healing (1). Although these associations are often attributed to stress-induced dysregulation of the hypothalamic–pituitary–adrenocortical axis (HPA) (e.g., refs. 2, 3), few human studies include assessments of stressful events, HPA response, and a disease outcome in the same subjects. The lack of such studies is partly attributable to the as yet incomplete understanding of the effects of prolonged stress on the HPA in human subjects (4) and on determining which stress-induced changes in HPA play a downstream role in disease risk. The simple notion that chronic stress acts through the direct effects of elevated circulating cortisol is becoming less likely (5, 6). What may matter more is how target tissues respond to cortisol, rather than levels of the hormone per se.

GCR refers to a decrease in the sensitivity of immune cells to glucocorticoid hormones that normally terminate the inflammatory response (6–9). Evidence for GCR in response to chronic stress has been found in parents of children with cancer (10), spouses of brain-cancer patients (11) and in persons reporting high levels of loneliness (5). Without sufficient glucocorticoid regulation, the duration and/or intensity of the inflammatory response increases, heightening risk for acute exacerbations such as occur in asthma of chronic inflammatory diseases such as CVD, and type II diabetes (12).

In the common cold, the typical signs and symptoms of illness are primarily caused by the release of the proinflammatory cytokines produced in response to infection (13). A series of studies have shown that chronic stress is associated with increased susceptibility to developing a common cold among persons experimentally exposed to an upper respiratory virus (e.g., refs. 14–17). This association has been replicated in cross-sectional and prospective studies conducted in natural settings (18). Although attempts to identify behavioral pathways linking stress to cold susceptibility have not been especially successful (14, 15), there is evidence consistent with stress effects resulting in increased disease risk because of their association with exaggerated local (in the nose) release of inflammatory cytokines (16). The explanation for this association has been that stress disrupts the HPA response and that the regulation of inflammation is under HPA control. However, cortisol levels based on 24-h urine (15) and waking diurnal assessments in saliva (19, 20) do not play a part in this process. Alternatively, what matters may be how the target tissue responds to cortisol, rather than the levels of the hormone per se. To the extent that chronic stress results in GCR, one might expect insufficient control over the inflammatory response to the infection, and consequently a greater expression of the signs and symptoms of disease.

The viral-challenge paradigm provides an ideal context to study the general model of stress leading to disease via effects on the HPA and inflammatory regulation. In these studies, stress and GCR are assessed before subjects are exposed to a virus and followed in quarantine to determine whether they develop a clinical illness (infection plus signs of illness). Here we conduct secondary analyses of two independent studies (15, 21), each using a different means of assessing GCR, to address the potential role of target tissue sensitivity to cortisol in linking stress to disease. In study 1, we attempt to replicate earlier evidence that stress exposure is associated with increased GCR (5, 6, 9–11) and test whether GCR prospectively predicts who will develop a cold when exposed to a rhinovirus. In study 2, we address whether GCR is prospectively associated with the magnitude of the local inflammatory cytokine response to being infected by a cold virus. We predict that GCR will be associated with experiencing a long-term threatening stressful experience, will interfere with the down-regulation of proinflammatory cytokine response, and will increase illness expression among persons infected with a cold virus.

Author contributions: S.C., W.J.D., and G.E.M. designed research; S.C., W.J.D., E.F., B.S.R., and R.B.T. performed research; E.F. and R.B.T. contributed new reagents/analytic tools; S.C. and D.J.-D. analyzed data; and S.C., D.J.-D., W.J.D., G.E.M., E.F., B.S.R., and R.B.T. wrote the paper.

The authors declare no conflict of interest.

*This Direct Submission article had a prearranged editor.

Freely available online through the PNAS open access option.

THE IMPORTANCE OF THE TIMELINE

- Birth?
- Childhood?
- Adolescence?
- Career?
- Relationships?
- Nutrition?
- Physical activity?
- Trauma?
- Sleep?
- Breathing patterns?
- Creativity?
- Are their needs being met?
- Do they have a sense of purpose?
- Rural vs urban?

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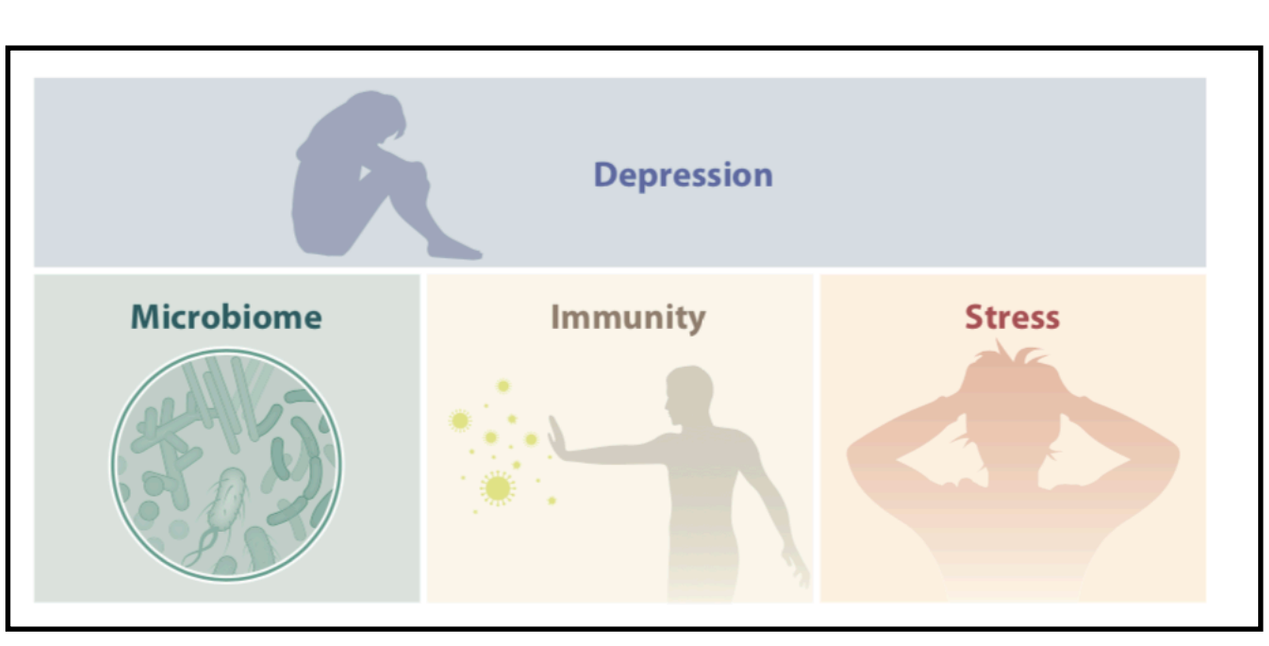
STRESS, CORTISOL RESISTANCE, INFLAMMATION



ANNUAL REVIEWS

Annual Review of Psychology

Depression's Unholy Trinity: Dysregulated Stress, Immunity, and the Microbiome

Joana da Cruz Pereira,[1,2] Kieran Rea,[1] Yvonne M. Nolan,[1,2] Olivia F. O'Leary,[1,2] Timothy G. Dinan,[1,3] and John F. Cryan[1,2]

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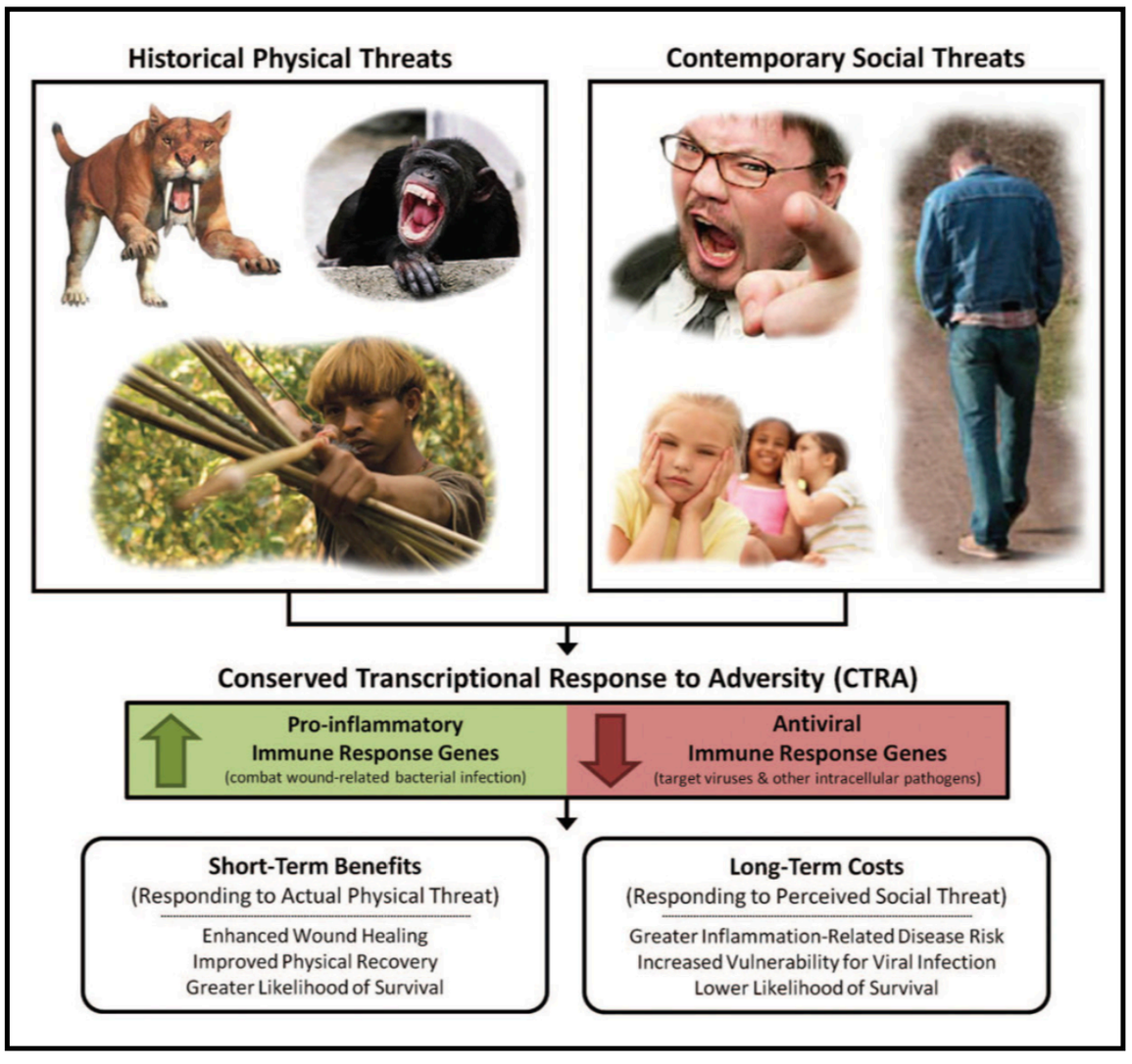
Keywords

stress, immunity, depression, gut microbiome, adult hippocampal neurogenesis

Abstract

Depression remains one of the most prevalent psychiatric disorders, with many patients not responding adequately to available treatments. Chronic or early-life stress is one of the key risk factors for depression. In addition, a growing body of data implicates chronic inflammation as a major player in depression pathogenesis. More recently, the gut microbiota has emerged as an important regulator of brain and behavior and also has been linked to depression. However, how this holy trinity of risk factors interact to maintain physiological homeostasis in the brain and body is not fully understood. In this review, we integrate the available data from animal and human studies on these three factors in the etiology and progression of depression. We also focus on the processes by which this microbiota-immune-stress matrix may influence centrally mediated events and on possible therapeutic interventions to correct imbalances in this triune.

STRESS, CORTISOL RESISTANCE, INFLAMMATION



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From Stress to Inflammation and Major Depressive Disorder: A Social Signal Transduction Theory of Depression

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University of California, Los Angeles

Abstract

Major life stressors, especially those involving interpersonal stress and social rejection, are among the strongest proximal risk factors for depression. In this review, we propose a biologically plausible, multilevel theory that describes neural, physiologic, molecular, and genomic mechanisms that link experiences of social-environmental stress with internal biological processes that drive depression pathogenesis. Central to this *social signal transduction theory of depression* is the hypothesis that experiences of social threat and adversity up-regulate components of the immune system involved in inflammation. The key mediators of this response, called *proinflammatory cytokines,* can in turn elicit profound changes in behavior, which include the initiation of depressive symptoms such as sad mood, anhedonia, fatigue, psychomotor retardation, and social-behavioral withdrawal. This highly conserved biological response to adversity is critical for survival during times of actual physical threat or injury. However, this response can also be activated by modern-day social, symbolic, or imagined threats, leading to an increasingly proinflammatory phenotype that may be a key phenomenon driving depression pathogenesis and recurrence, as well as the overlap of depression with several somatic conditions including asthma, rheumatoid arthritis, chronic pain, metabolic syndrome, cardiovascular disease, obesity, and neurodegeneration. Insights from this theory may thus shed light on several important questions including how depression develops, why it frequently recurs, why it is strongly predicted by early life stress, and why it often co-occurs with symptoms of anxiety and with certain physical disease conditions. This work may also suggest new opportunities for preventing and treating depression by targeting inflammation.

Keywords

early life stress; social threat; cytokines; mechanisms; disease

Depression is among the most common and costly of all psychiatric disorders. Nearly one in four women and one in six men experience depression during their lifetime (Kessler et al., 2010), and up to 65% of individuals have recurrent episodes of the disorder (Eaton et al.,

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WHEN HEALING BECOMES TOO MUCH

Healing can become the source of the stress.

RESILIENCE

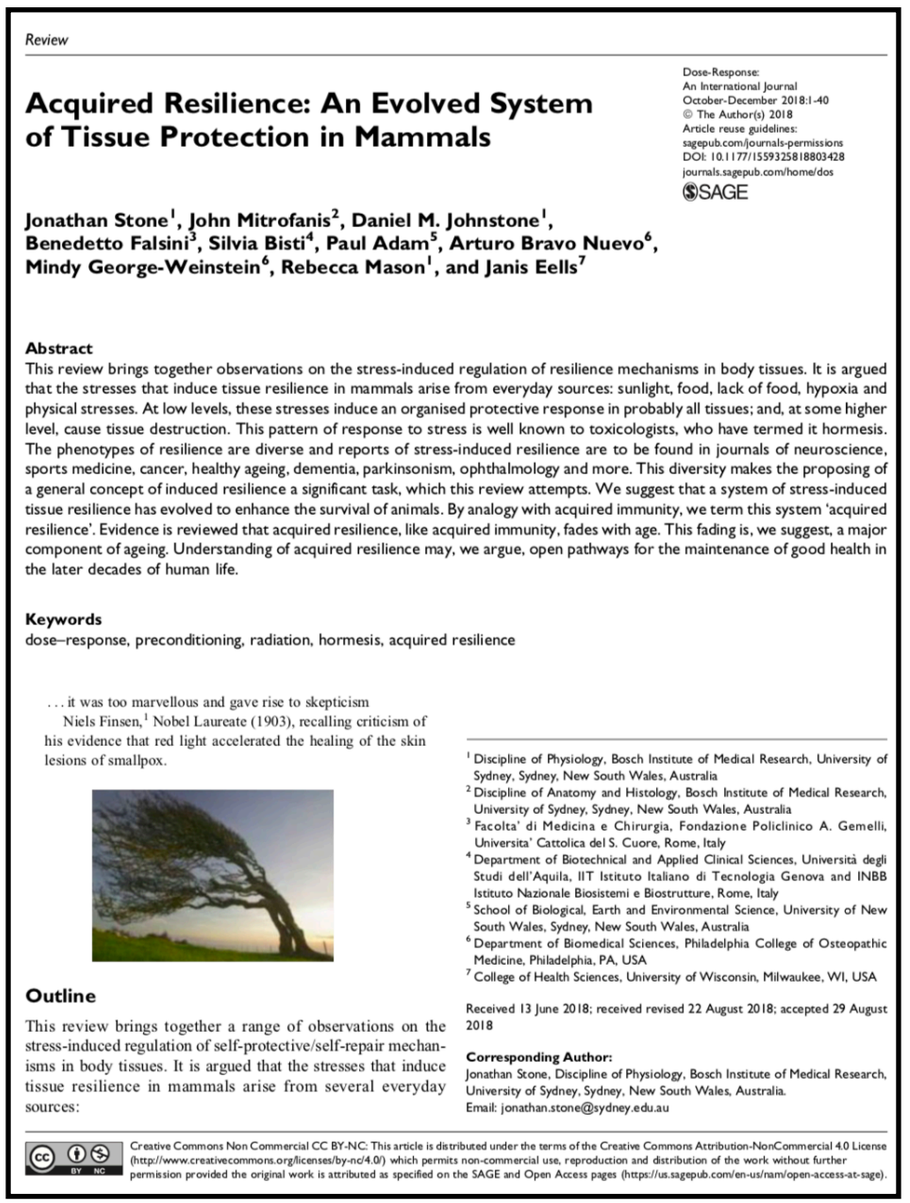
“Resilience is not a trait that people have or do not have. It involves behaviours, thoughts and actions that can be learned and developed by anyone.”

- The American Psychological Association (APA) -

SETTING THE SCENE

ACQUIRED RESILIENCE

- Fasting
- Sunlight
- Exercise
- Nutrition
- Hypoxia
- Physical stress (hot/cold)



Review

Acquired Resilience: An Evolved System of Tissue Protection in Mammals

Dose-Response:
An International Journal
October-December 2018:1-40

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Jonathan Stone[1], John Mitrofanis[2], Daniel M. Johnstone[1], Benedetto Falsini[3], Silvia Bisti[4], Paul Adam[5], Arturo Bravo Nuevo[6], Mindy George-Weinstein[6], Rebecca Mason[1], and Janis Eells[7]

Abstract

This review brings together observations on the stress-induced regulation of resilience mechanisms in body tissues. It is argued that the stresses that induce tissue resilience in mammals arise from everyday sources: sunlight, food, lack of food, hypoxia and physical stresses. At low levels, these stresses induce an organised protective response in probably all tissues; and, at some higher level, cause tissue destruction. This pattern of response to stress is well known to toxicologists, who have termed it hormesis. The phenotypes of resilience are diverse and reports of stress-induced resilience are to be found in journals of neuroscience, sports medicine, cancer, healthy ageing, dementia, parkinsonism, ophthalmology and more. This diversity makes the proposing of a general concept of induced resilience a significant task, which this review attempts. We suggest that a system of stress-induced tissue resilience has evolved to enhance the survival of animals. By analogy with acquired immunity, we term this system 'acquired resilience'. Evidence is reviewed that acquired resilience, like acquired immunity, fades with age. This fading is, we suggest, a major component of ageing. Understanding of acquired resilience may, we argue, open pathways for the maintenance of good health in the later decades of human life.

Keywords

dose–response, preconditioning, radiation, hormesis, acquired resilience

. . . it was too marvellous and gave rise to skepticism
Niels Finsen,[1] Nobel Laureate (1903), recalling criticism of his evidence that red light accelerated the healing of the skin lesions of smallpox.

Outline

This review brings together a range of observations on the stress-induced regulation of self-protective/self-repair mechanisms in body tissues. It is argued that the stresses that induce tissue resilience in mammals arise from several everyday sources:

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ALLOSTASIS

Allostasis refers to the process whereby an organism maintains physiological stability by changing parameters of its internal milieu by matching them appropriately to environmental demands.

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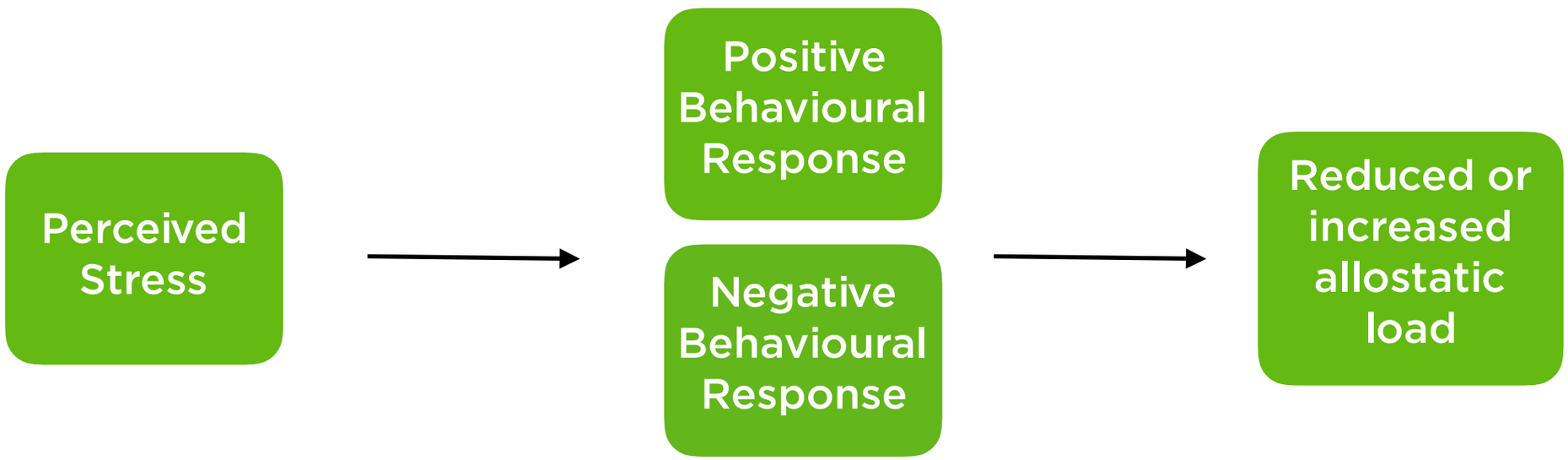
ALLOSTATIC LOAD

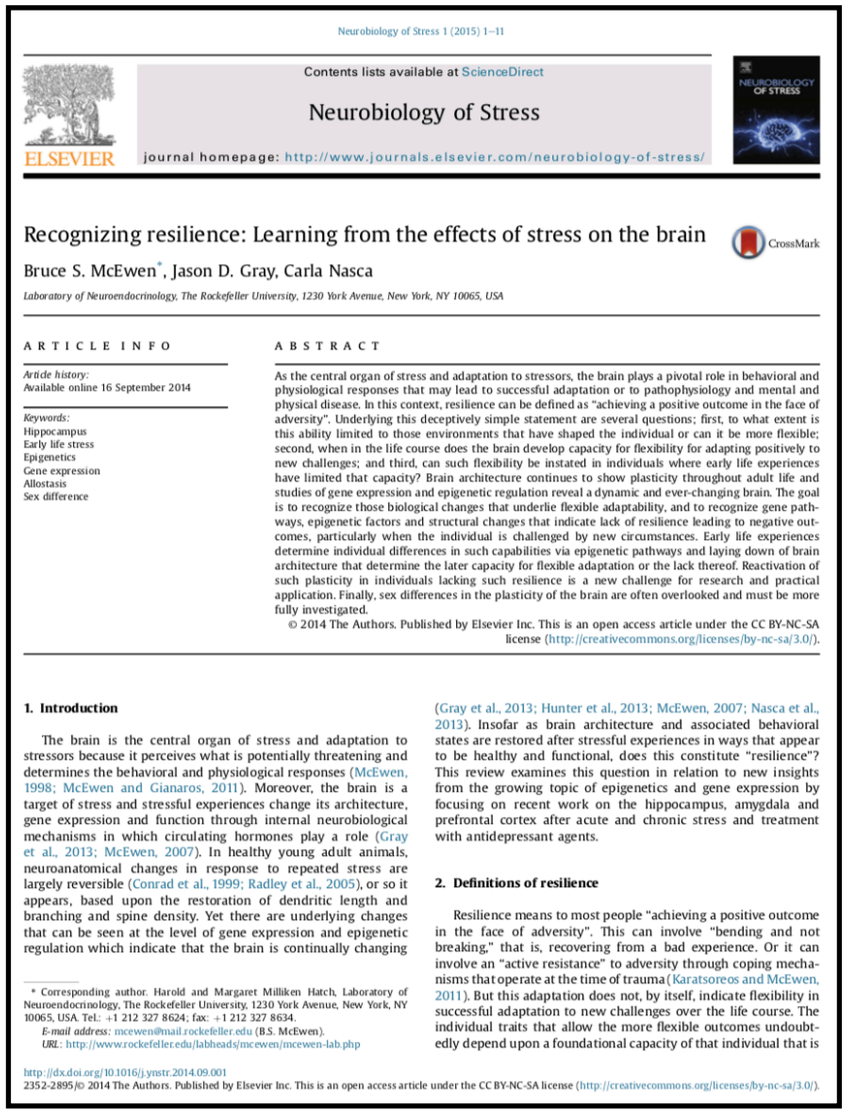
Allostatic load represents the ‘wear and tear’ the body experiences when repeated allostatic responses are activated.



THE BRAIN IS AT THE CENTRE

- The brain is the central organ of stress and adaptation to stressors because it perceives what is potentially threatening and determines the behavioural and physiological responses.

- Moreover, the brain is a target of stress and stressful experiences change its architecture, gene expression and function through internal neurobiological mechanisms in which circulating hormones play a role.



Neurobiology of Stress 1 (2015) 1–11

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journal homepage: http://www.journals.elsevier.com/neurobiology-of-stress/

Recognizing resilience: Learning from the effects of stress on the brain

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ABSTRACT

As the central organ of stress and adaptation to stressors, the brain plays a pivotal role in behavioral and physiological responses that may lead to successful adaptation or to pathophysiology and mental and physical disease. In this context, resilience can be defined as "achieving a positive outcome in the face of adversity". Underlying this deceptively simple statement are several questions; first, to what extent is this ability limited to those environments that have shaped the individual or can it be more flexible; second, when in the life course does the brain develop capacity for flexibility for adapting positively to new challenges; and third, can such flexibility be instated in individuals where early life experiences have limited that capacity? Brain architecture continues to show plasticity throughout adult life and studies of gene expression and epigenetic regulation reveal a dynamic and ever-changing brain. The goal is to recognize those biological changes that underlie flexible adaptability, and to recognize gene pathways, epigenetic factors and structural changes that indicate lack of resilience leading to negative outcomes, particularly when the individual is challenged by new circumstances. Early life experiences determine individual differences in such capabilities via epigenetic pathways and laying down of brain architecture that determine the later capacity for flexible adaptation or the lack thereof. Reactivation of such plasticity in individuals lacking such resilience is a new challenge for research and practical application. Finally, sex differences in the plasticity of the brain are often overlooked and must be more fully investigated.

1. Introduction

The brain is the central organ of stress and adaptation to stressors because it perceives what is potentially threatening and determines the behavioral and physiological responses (McEwen, 1998; McEwen and Gianaros, 2011). Moreover, the brain is a target of stress and stressful experiences change its architecture, gene expression and function through internal neurobiological mechanisms in which circulating hormones play a role (Gray et al., 2013; McEwen, 2007). In healthy young adult animals, neuroanatomical changes in response to repeated stress are largely reversible (Conrad et al., 1999; Radley et al., 2005), or so it appears, based upon the restoration of dendritic length and branching and spine density. Yet there are underlying changes that can be seen at the level of gene expression and epigenetic regulation which indicate that the brain is continually changing (Gray et al., 2013; Hunter et al., 2013; McEwen, 2007; Nasca et al., 2013). Insofar as brain architecture and associated behavioral states are restored after stressful experiences in ways that appear to be healthy and functional, does this constitute "resilience"? This review examines this question in relation to new insights from the growing topic of epigenetics and gene expression by focusing on recent work on the hippocampus, amygdala and prefrontal cortex after acute and chronic stress and treatment with antidepressant agents.

2. Definitions of resilience

Resilience means to most people "achieving a positive outcome in the face of adversity". This can involve "bending and not breaking," that is, recovering from a bad experience. Or it can involve an "active resistance" to adversity through coping mechanisms that operate at the time of trauma (Karatsoreos and McEwen, 2011). But this adaptation does not, by itself, indicate flexibility in successful adaptation to new challenges over the life course. The individual traits that allow the more flexible outcomes undoubtedly depend upon a foundational capacity of that individual that is

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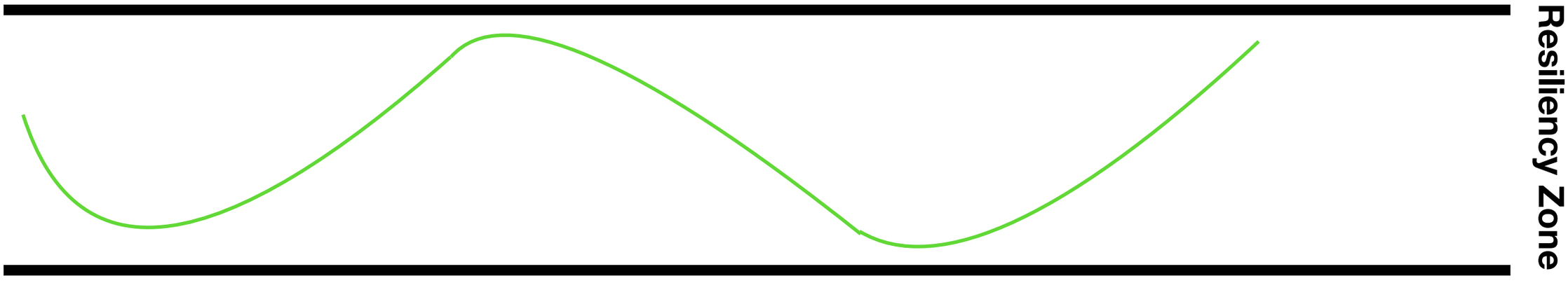
THE RESILIENCY ZONE

An internal state of balance where we are at our best, able to learn, solve problems, and work effectively with others.



- J Am Psychiatr Nurses Assoc, 2018;24(1):76-84 -

- Nurs Outlook. 2019 Dec 30. pii: S0029-6554(19)30325-2 -

RESILIENCE

- A stressor pushes the physiological system away from its baseline state toward a lower utility state. The physiological system may return toward the original state in one attractor basin but may be shifted to a state in another, lower utility attractor basin. While some physiological changes induced by stressors may benefit health, there is often a chronic wear and tear cost.

Behavioural Brain Research 282 (2015) 144–154

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Behavioural Brain Research

journal homepage: www.elsevier.com/locate/bbr

Review

A systems approach to stress, stressors and resilience in humans

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HIGHLIGHTS

- Stress physiology was reviewed from a systems science perspective.
- Stressors push biological systems from baseline toward lower utility states.
- The system change is based on objective attributes and perceptions of the stressor.
- Allostatic load is utility reduction due to stress-related state changes.
- Resilience affects ability to return to high utility state following perturbations.

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Resilience

ABSTRACT

The paper focuses on the biology of stress and resilience and their biomarkers in humans from the system science perspective. A stressor pushes the physiological system away from its baseline state toward a lower utility state. The physiological system may return toward the original state in one attractor basin but may be shifted to a state in another, lower utility attractor basin. While some physiological changes induced by stressors may benefit health, there is often a chronic wear and tear cost due to implementing changes to enable the return of the system to its baseline state and maintain itself in the high utility baseline attractor basin following repeated perturbations. This cost, also called *allostatic load*, is the utility reduction associated with both a change in state and with alterations in the attractor basin that affect system responses following future perturbations. This added cost can increase the time course of the return to baseline or the likelihood of moving into a different attractor basin following a perturbation. Opposite to this is the system's resilience which influences its ability to return to the high utility attractor basin following a perturbation by increasing the likelihood and/or speed of returning to the baseline state following a stressor. This review paper is a qualitative systematic review; it covers areas most relevant for moving the stress and resilience field forward from a more quantitative and neuroscientific perspective.

Contents

Abbreviations: ACTH, adrenocorticotrophic hormone; ANS, autonomic nervous system; DHEA, dehydroepiandrosterone; DHEAS, dehydroepiandrosterone sulfate; EEG, electroencephalogram; fMRI, functional magnetic resonance imaging; HgbA1c, glycosylated hemoglobin A1c; HPA axis, hypothalamo–pituitary–adrenal axis; HRV, heart rate variability; PET, positron emission tomography; PTSD, post-traumatic stress disorder; SSRI, selective serotonin reuptake inhibitor.

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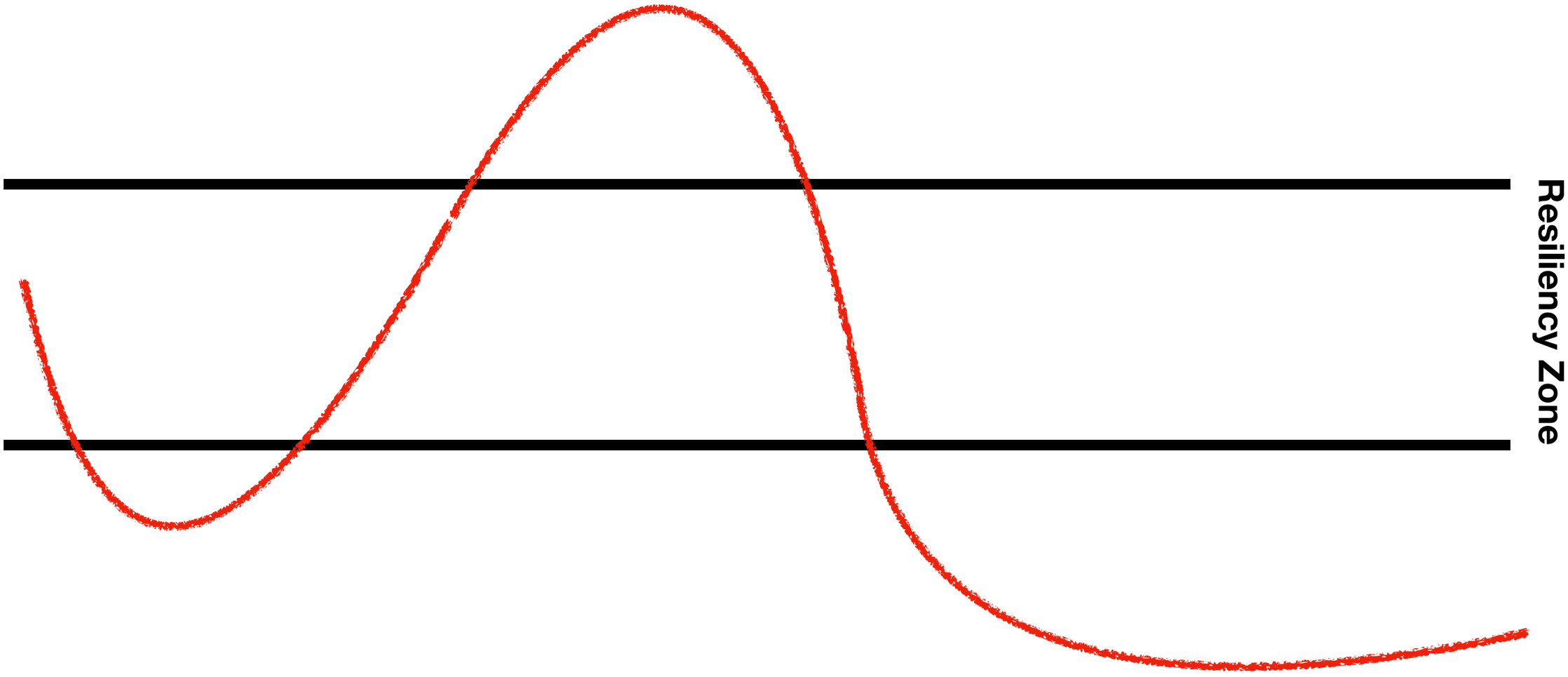
THE RESILIENCY ZONE



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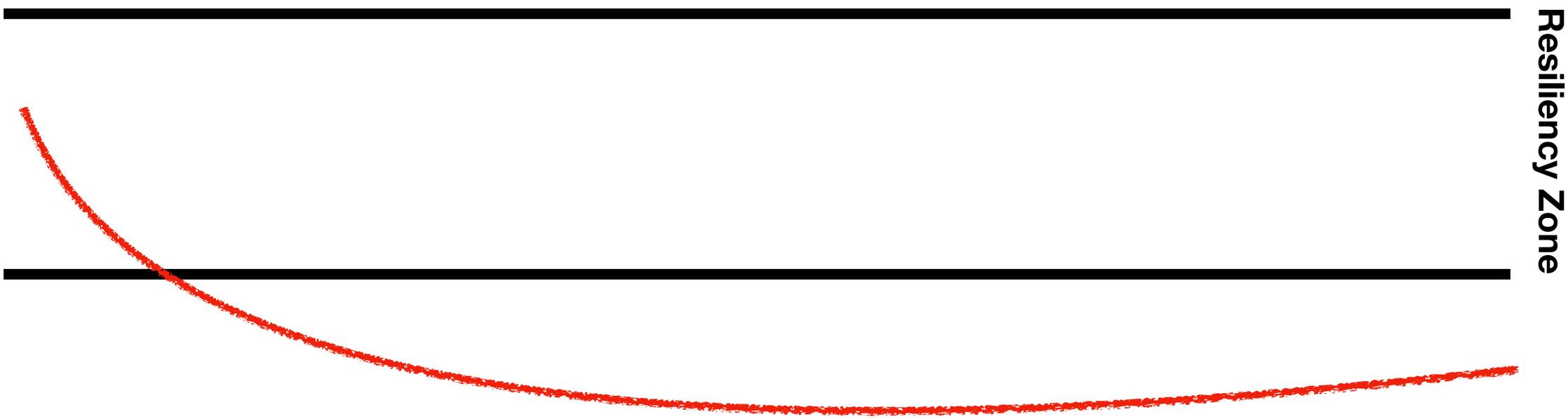

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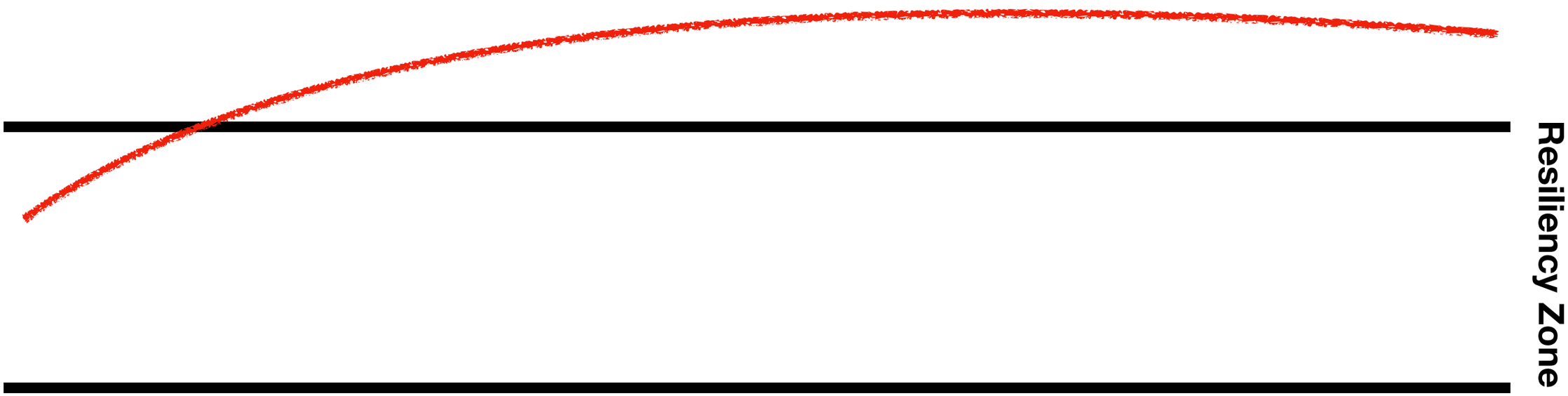

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Logan & Barksdale (2008)

DEFINITIONS & MODELS OF RESILIENCE

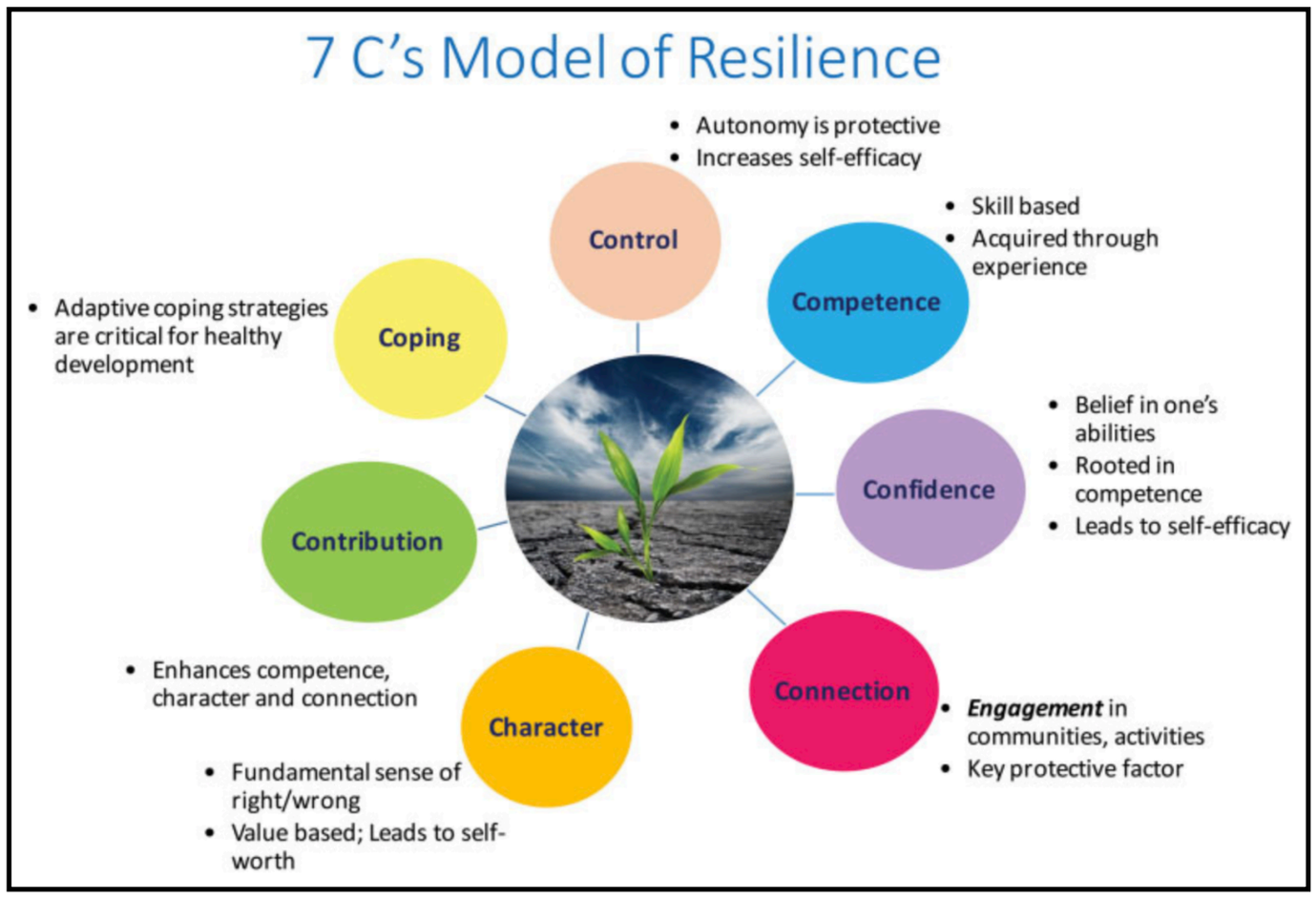
DEFINITIONS

Physical (overall) Resilience	Mental Resilience
The process of negotiating, managing and adapting in the face of adversity, trauma, tragedy, threats, or even significant sources of stress.	To be able to effectively set goals and consistently achieve them, without getting distracted. You see challenges, change, and adversity as opportunities rather than threats and thus are likely to be flexible and agile.
Emotional Resilience	**Spiritual Resilience**
The ability to generate positive emotion and the ability to recover from negative emotion.	The ability to sustain an individual's sense of self and purpose through a set of beliefs, principles or values.

PSYCHO-SPIRITUAL STRESS

A crisis of values, meaning, and purpose; joyless striving (instead of productive, satisfying, meaningful and fulfilling work); and a misalignment with one's core spiritual beliefs.

THE 7 C'S MODEL



From Burnout to Well-Being: A Focus on Resilience

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Clin Colon Rectal Surg

Abstract

Burnout is a widespread problem in health care. Factors that contribute to enhancing engagement and building resiliency are widely discussed, but the data supporting these practices are not well understood. Interventions aimed at increasing engagement and promoting resiliency are targeted toward individual practitioners, health care institutions, and national organizations. Knowledge of the data supporting various kinds of interventions is vital to implementing change meaningfully. Prevention of burnout should start early in training with appropriate modeling and input from mentors and should incorporate stress management strategies. The most compelling data for building resilience requires institutions, physicians, and their support staff to align their values to create a mutual culture of wellness and engagement. It is imperative that institutional and national reform allows us as physicians to preserve our relationships with patients and colleagues, while also prioritizing time to reflect and pursue outside interests that recharge and restore.

Keywords
- burnout
- resilience
- engagement
- stress management
- well-being

The problem of surgeon burnout and depression cannot be overstated and is discussed and evaluated in the prior chapter in detail. There exists compelling evidence that the rate of depression and burnout is increasing in the field of general surgery. This phenomenon leads to medical errors and loss of productivity and affects both younger surgeons and females to a greater degree. Critical examination of factors affecting resilience and well-being remains limited, and the data that exist are not well understood by either physicians or administrators.

It is evident that key components of burnout—emotional exhaustion, depersonalization, and depression—exist in nursing and the allied professions as well. In fact, important interventions and observations from allied professionals were instrumental in developing metrics to evaluate burnout in physicians. Interventions to promote surgeon well-being and resilience are mostly generalized from those developed in other specialties and subspecialties. Although this may be quite appropriate, as it appears that, regardless of specialty, the same stressors that affect other physicians and health care professionals also affect surgeons in much the same way, there are subtle and not-so-subtle differences in how others perceive surgeons and the work we do as well as our resultant errors. Charles Bosk famously says in *Forgive and Remember: Managing Medical Failure*, "When the patient of an internist dies, the natural question is … 'What happened?' When the patient of a surgeon dies, his colleagues ask, 'What did you do?'"[1]

This study seeks to better describe strategies for promoting physician well-being and resilience and present them not as the "opposite" but as an "antidote" or counterpoint for burnout and depression driven by clinical activity. Furthermore, it seeks to emphasize and describe the concept of prevention. Factors affecting individual agency and those involving institutional and national prerogatives and programs to prevent burnout and promote well-being are described and evaluated. It seems very logical that emotional, intellectual, and situational factors affecting depression and burnout exist for even the most resilient surgeons. Understanding data supporting strategies to promote and maintain well-being is effective for everyone practicing surgery today.

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ASSESSING RESILIENCE

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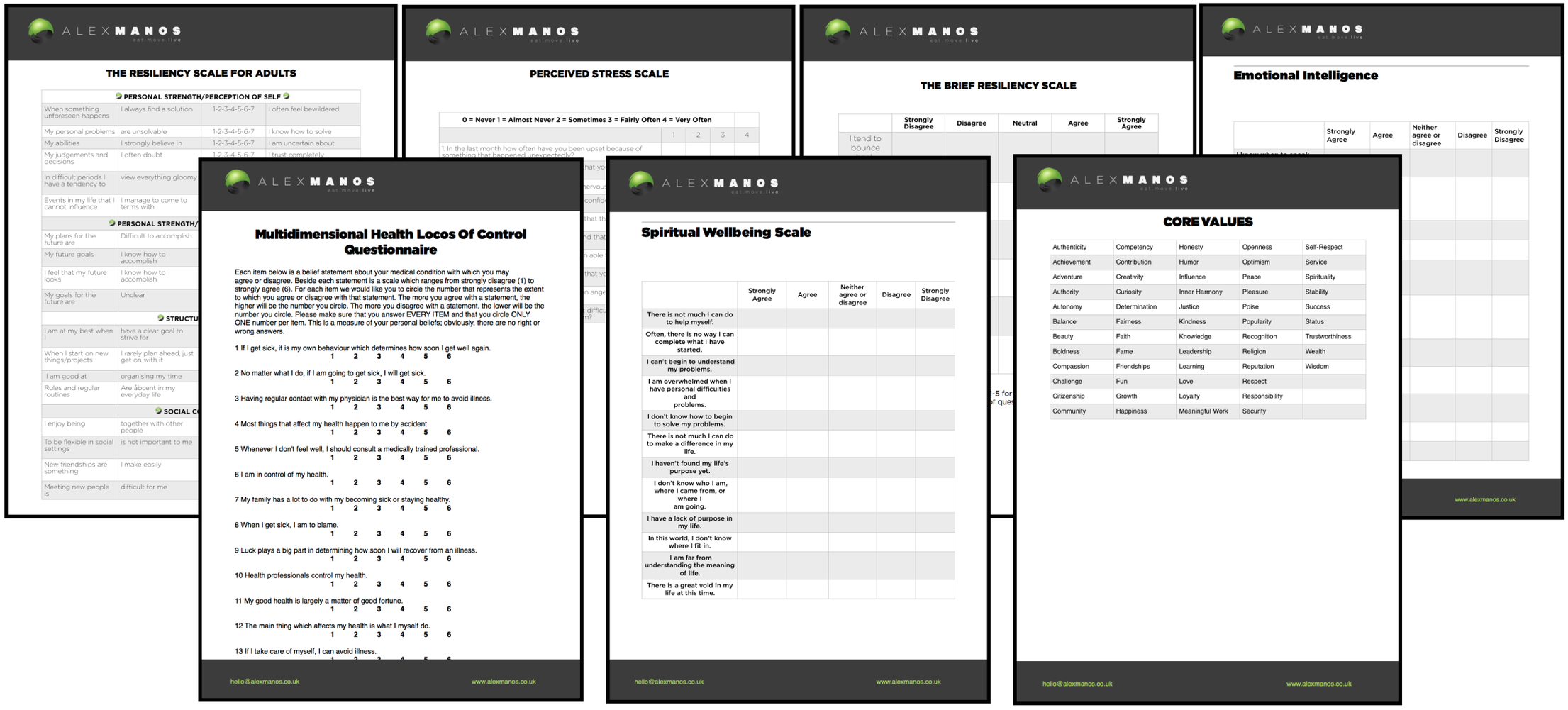
ASSESSING RESILIENCE - SUBJECTIVE



THE RESILIENCY SCALE FOR ADULTS

PERSONAL STRENGTH/PERCEPTION OF SELF			
When something unforeseen happens	I always find a solution	1-2-3-4-5-6-7	I often feel bewildered
My personal problems	are unsolvable	1-2-3-4-5-6-7	I know how to solve
My abilities	I strongly believe in	1-2-3-4-5-6-7	I am uncertain about
My judgements and decisions	I often doubt	1-2-3-4-5-6-7	I trust completely
In difficult periods I have a tendency to	view everything gloomy		
Events in my life that I cannot influence	I manage to come to terms with		
PERSONAL STRENGTH/			
My plans for the future are	Difficult to accomplish		
My future goals	I know how to accomplish		
I feel that my future looks	I know how to accomplish		
My goals for the future are	Unclear		
STRUCTU			
I am at my best when I	have a clear goal to strive for		
When I start on new things/projects	I rarely plan ahead, just get on with it		
I am good at	organising my time		
Rules and regular routines	Are åbcent in my everyday life		
SOCIAL C			
I enjoy being	together with other people		
To be flexible in social settings	is not important to me		
New friendships are something	I make easily		
Meeting new people is	difficult for me		

PERCEIVED STRESS SCALE

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often				
	1	2	3	4
1. In the last month how often have you been upset because of something that happened unexpectedly?				

THE BRIEF RESILIENCY SCALE

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I tend to bounce					

Emotional Intelligence

	Strongly Agree	Agree	Neither agree or disagree	Disagree	Strongly Disagree

Multidimensional Health Locos Of Control Questionnaire

Each item below is a belief statement about your medical condition with which you may agree or disagree. Beside each statement is a scale which ranges from strongly disagree (1) to strongly agree (6). For each item we would like you to circle the number that represents the extent to which you agree or disagree with that statement. The more you agree with a statement, the higher will be the number you circle. The more you disagree with a statement, the lower will be the number you circle. Please make sure that you answer EVERY ITEM and that you circle ONLY ONE number per item. This is a measure of your personal beliefs; obviously, there are no right or wrong answers.

1 If I get sick, it is my own behaviour which determines how soon I get well again.
1 2 3 4 5 6

2 No matter what I do, if I am going to get sick, I will get sick.
1 2 3 4 5 6

3 Having regular contact with my physician is the best way for me to avoid illness.
1 2 3 4 5 6

4 Most things that affect my health happen to me by accident
1 2 3 4 5 6

5 Whenever I don't feel well, I should consult a medically trained professional.
1 2 3 4 5 6

6 I am in control of my health.
1 2 3 4 5 6

7 My family has a lot to do with my becoming sick or staying healthy.
1 2 3 4 5 6

8 When I get sick, I am to blame.
1 2 3 4 5 6

9 Luck plays a big part in determining how soon I will recover from an illness.
1 2 3 4 5 6

10 Health professionals control my health.
1 2 3 4 5 6

11 My good health is largely a matter of good fortune.
1 2 3 4 5 6

12 The main thing which affects my health is what I myself do.
1 2 3 4 5 6

13 If I take care of myself, I can avoid illness.

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Spiritual Wellbeing Scale

	Strongly Agree	Agree	Neither agree or disagree	Disagree	Strongly Disagree
There is not much I can do to help myself.					
Often, there is no way I can complete what I have started.					
I can't begin to understand my problems.					
I am overwhelmed when I have personal difficulties and problems.					
I don't know how to begin to solve my problems.					
There is not much I can do to make a difference in my life.					
I haven't found my life's purpose yet.					
I don't know who I am, where I came from, or where I am going.					
I have a lack of purpose in my life.					
In this world, I don't know where I fit in.					
I am far from understanding the meaning of life.					
There is a great void in my life at this time.					

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CORE VALUES

Authenticity	Competency	Honesty	Openness	Self-Respect
Achievement	Contribution	Humor	Optimism	Service
Adventure	Creativity	Influence	Peace	Spirituality
Authority	Curiosity	Inner Harmony	Pleasure	Stability
Autonomy	Determination	Justice	Poise	Success
Balance	Fairness	Kindness	Popularity	Status
Beauty	Faith	Knowledge	Recognition	Trustworthiness
Boldness	Fame	Leadership	Religion	Wealth
Compassion	Friendships	Learning	Reputation	Wisdom
Challenge	Fun	Love	Respect	
Citizenship	Growth	Loyalty	Responsibility	
Community	Happiness	Meaningful Work	Security	

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ASSESSING RESILIENCE

Physical (overall) Resilience	Mental Resilience
• Subjective: The Resiliency Scale x 2	• Subjective: Perceived Stress Questionnaire
Emotional Resilience	**Spiritual Resilience**
• Subjective: The Cognitive and Affective Mindfulness Scale, Emotional Intelligence	• Subjective: Spiritual Wellbeing Scale, Core Values List

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ASSESSING RESILIENCE - OBJECTIVE

"HRV shows promise as a global psychophysiological index of resilience."

- An et al., (2020) Mil Med 2;185(3-4):363-369 -

WHERE ARE WE AT?

- We’ve laid some groundwork and we’ve defined each type of resilience.
- We’ve got ways to assess each type of resilience.
- Let’s see how this plays out in clinical practice….

PURPOSE IN LIFE PREDICTS ALLOSTATIC LOAD TEN YEARS LATER

Conclusion: The current study provides the first empirical evidence for the long-term physiological correlates of life purpose and supports the hypothesis that self-health locus of control acts as one proximal psychological mechanism through which life purpose may be linked to positive biological outcomes.

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Purpose in Life Predicts Allostatic Load Ten Years Later

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Abstract

Objective—Living a purposeful life is associated with better mental and physical health, including longevity. Accumulating evidence shows that these associations might be explained by the association between life purpose and regulation of physiological systems involved in the stress response. The aim of this study was to investigate the prospective associations between life purpose and allostatic load over a 10-year period.

Methods—Analyses were conducted using data from the Midlife in the United States (MIDUS) survey. Assessment of life purpose, psychological covariates and demographics were obtained at baseline, while biomarkers of allostatic load were assessed at the 10-year follow-up.

Results—We found that greater life purpose predicted lower levels of allostatic load at follow-up, even when controlling for other aspects of psychological well-being potentially associated with allostatic load. Further, life purpose was also a strong predictor of individual differences in self-health locus of control—i.e., beliefs about how much influence individuals can exert on their own health—which, in turn, partially mediated the association between purpose and allostatic load. Although life purpose was also negatively linked to other-health locus of control —i.e., the extent to which individuals believe their health is controlled by others/chance —this association did not mediate the impact of life purpose on allostatic load.

Conclusion—The current study provides the first empirical evidence for the long-term physiological correlates of life purpose and supports the hypothesis that self-health locus of

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Conflict of Interest
None declared.

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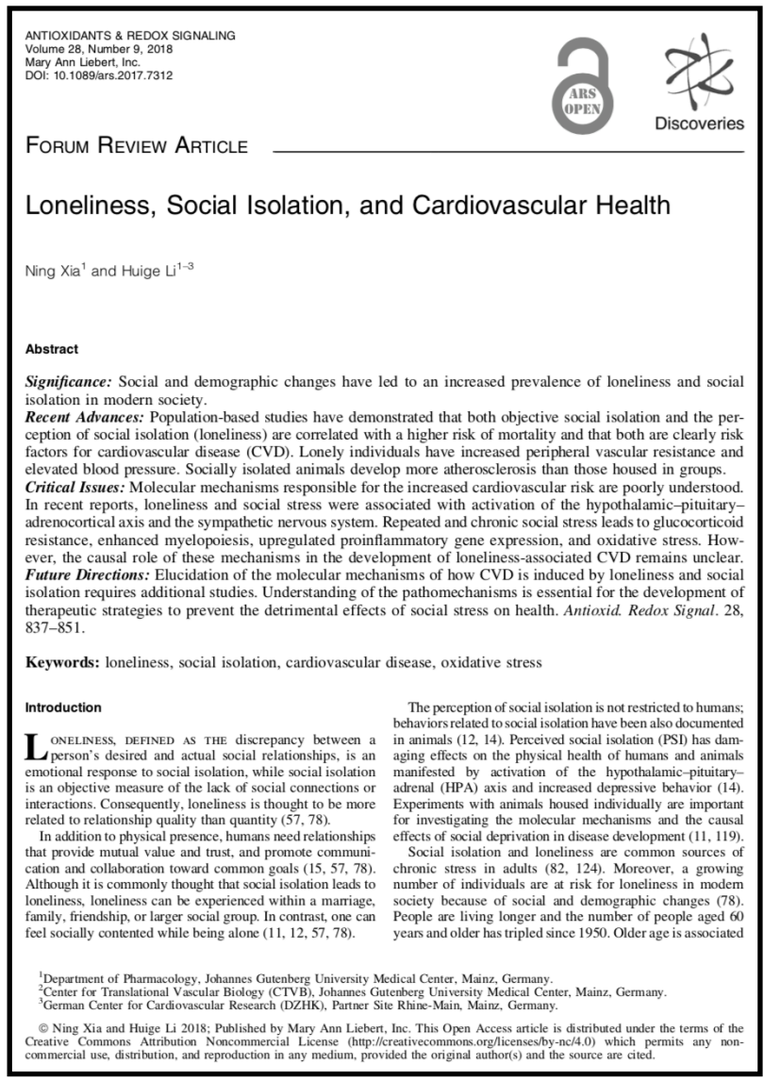
LONELINESS & INFLAMMATION

- Social isolation and socioeconomic stress have been associated with the conserved transcriptional response to adversity (CTRA) in leukocytes, characterised by up-regulation of pro-inflammatory gene expression and down regulation of antibody- and antiviral immunity-related genes.



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ARS OPEN Discoveries

FORUM REVIEW ARTICLE

Loneliness, Social Isolation, and Cardiovascular Health

Ning Xia[1] and Huige Li[1–3]

Abstract

Significance: Social and demographic changes have led to an increased prevalence of loneliness and social isolation in modern society.
Recent Advances: Population-based studies have demonstrated that both objective social isolation and the perception of social isolation (loneliness) are correlated with a higher risk of mortality and that both are clearly risk factors for cardiovascular disease (CVD). Lonely individuals have increased peripheral vascular resistance and elevated blood pressure. Socially isolated animals develop more atherosclerosis than those housed in groups.
Critical Issues: Molecular mechanisms responsible for the increased cardiovascular risk are poorly understood. In recent reports, loneliness and social stress were associated with activation of the hypothalamic–pituitary–adrenocortical axis and the sympathetic nervous system. Repeated and chronic social stress leads to glucocorticoid resistance, enhanced myelopoiesis, upregulated proinflammatory gene expression, and oxidative stress. However, the causal role of these mechanisms in the development of loneliness-associated CVD remains unclear.
Future Directions: Elucidation of the molecular mechanisms of how CVD is induced by loneliness and social isolation requires additional studies. Understanding of the pathomechanisms is essential for the development of therapeutic strategies to prevent the detrimental effects of social stress on health. *Antioxid. Redox Signal*. 28, 837–851.

Keywords: loneliness, social isolation, cardiovascular disease, oxidative stress

Introduction

LONELINESS, DEFINED AS THE discrepancy between a person's desired and actual social relationships, is an emotional response to social isolation, while social isolation is an objective measure of the lack of social connections or interactions. Consequently, loneliness is thought to be more related to relationship quality than quantity (57, 78).

In addition to physical presence, humans need relationships that provide mutual value and trust, and promote communication and collaboration toward common goals (15, 57, 78). Although it is commonly thought that social isolation leads to loneliness, loneliness can be experienced within a marriage, family, friendship, or larger social group. In contrast, one can feel socially contented while being alone (11, 12, 57, 78).

The perception of social isolation is not restricted to humans; behaviors related to social isolation have been also documented in animals (12, 14). Perceived social isolation (PSI) has damaging effects on the physical health of humans and animals manifested by activation of the hypothalamic–pituitary–adrenal (HPA) axis and increased depressive behavior (14). Experiments with animals housed individually are important for investigating the molecular mechanisms and the causal effects of social deprivation in disease development (11, 119).

Social isolation and loneliness are common sources of chronic stress in adults (82, 124). Moreover, a growing number of individuals are at risk for loneliness in modern society because of social and demographic changes (78). People are living longer and the number of people aged 60 years and older has tripled since 1950. Older age is associated

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ACE'S & ALLOSTATIC LOAD

- These findings reveal the long-term impact of childhood abuse and neglect on physical health over 30 years later.

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Child Abuse & Neglect

ELSEVIER

Research article

Childhood maltreatment predicts allostatic load in adulthood☆

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ABSTRACT

Childhood maltreatment has been linked to numerous negative health outcomes. However, few studies have examined mediating processes using longitudinal designs or objectively measured biological data. This study sought to determine whether child abuse and neglect predicts allostatic load (a composite indicator of accumulated stress-induced biological risk) and to examine potential mediators. Using a prospective cohort design, children (ages 0–11) with documented cases of abuse and neglect were matched with non-maltreated children and followed up into adulthood with in-person interviews and a medical status exam (mean age 41). Allostatic load was assessed with nine physical health indicators. Child abuse and neglect predicted allostatic load, controlling for age, sex, and race. The direct effect of child abuse and neglect persisted despite the introduction of potential mediators of internalizing and externalizing problems in adolescence and social support and risky lifestyle in middle adulthood. These findings reveal the long-term impact of childhood abuse and neglect on physical health over 30 years later.

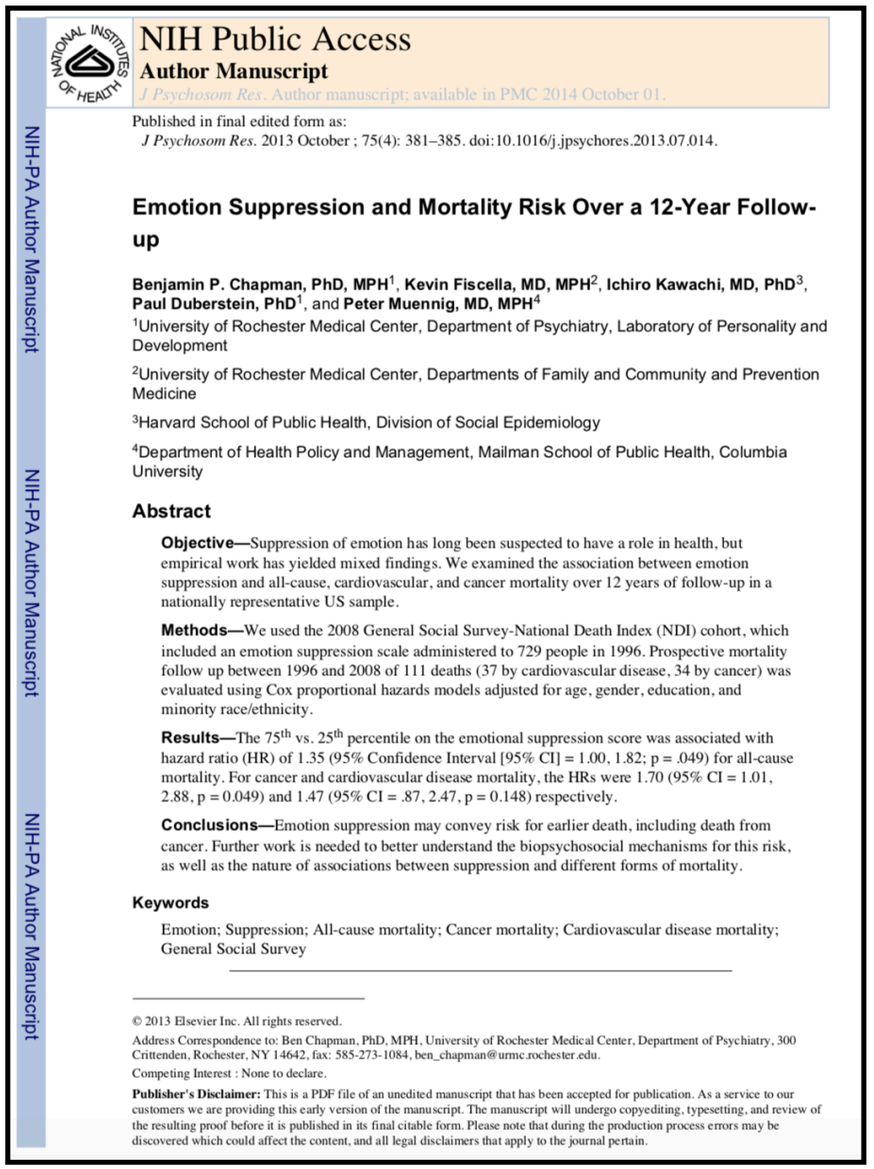
Introduction

Child maltreatment represents a serious public health concern in the United States and abroad (Gilbert et al., 2009; U.S. Department of Health and Human Services, 2013) and has been related to a number of physical health conditions, including hypertension, diabetes, asthma, heart disease, inflammation, obesity, and poor general health (Chartier, Walker, & Naimark, 2007; Danese, Pariante, Caspi, Taylor, & Poulton, 2007; Flaherty et al., 2006; Wegman & Stetler, 2009; Widom, Czaja, Bentley, & Johnson, 2012). With some exceptions, the existing literature relies heavily on cross-sectional designs that provide support for an association between childhood adversities and health outcomes. However, a review of studies relating childhood trauma and physical disorders among adults in the US (Goodwin & Stein, 2004) concluded that future research needs to include "objectively measured biological data using a longitudinal design". This study is an attempt to understand how these childhood experiences "get under the skin".

Prior research has documented the impact of early childhood adversities on health-related outcomes by focusing on disparities in morbidity (Batten et al., 2004; Dube et al., 2009) and mortality (Howard et al., 2000). However, there has been increased interest in allostatic load (McEwen, 1998), a construct that refers to the process whereby chronic or recurrent stress

EMOTIONAL SUPPRESSION

- Emotion suppression, defined as a tendency to inhibit the expression of emotion, has long been suspected to influence health, with recent meta-analytic evidence linking suppression and chronic disease.



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Emotion Suppression and Mortality Risk Over a 12-Year Follow-up

Benjamin P. Chapman, PhD, MPH[1], **Kevin Fiscella, MD, MPH**[2], **Ichiro Kawachi, MD, PhD**[3], **Paul Duberstein, PhD**[1], and **Peter Muennig, MD, MPH**[4]

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Abstract

Objective—Suppression of emotion has long been suspected to have a role in health, but empirical work has yielded mixed findings. We examined the association between emotion suppression and all-cause, cardiovascular, and cancer mortality over 12 years of follow-up in a nationally representative US sample.

Methods—We used the 2008 General Social Survey-National Death Index (NDI) cohort, which included an emotion suppression scale administered to 729 people in 1996. Prospective mortality follow up between 1996 and 2008 of 111 deaths (37 by cardiovascular disease, 34 by cancer) was evaluated using Cox proportional hazards models adjusted for age, gender, education, and minority race/ethnicity.

Results—The 75th vs. 25th percentile on the emotional suppression score was associated with hazard ratio (HR) of 1.35 (95% Confidence Interval [95% CI] = 1.00, 1.82; p = .049) for all-cause mortality. For cancer and cardiovascular disease mortality, the HRs were 1.70 (95% CI = 1.01, 2.88, p = 0.049) and 1.47 (95% CI = .87, 2.47, p = 0.148) respectively.

Conclusions—Emotion suppression may convey risk for earlier death, including death from cancer. Further work is needed to better understand the biopsychosocial mechanisms for this risk, as well as the nature of associations between suppression and different forms of mortality.

Keywords

Emotion; Suppression; All-cause mortality; Cancer mortality; Cardiovascular disease mortality; General Social Survey

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Competing Interest : None to declare.

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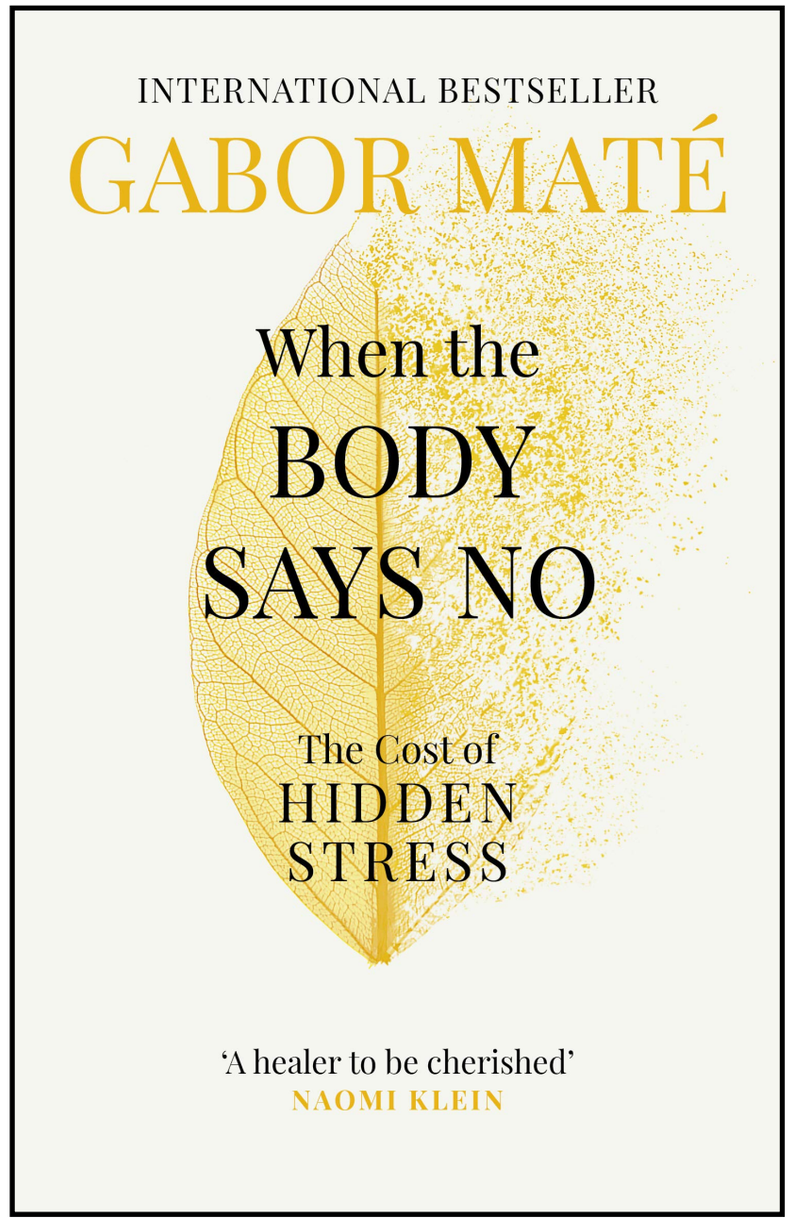
THE PERSONALITY OF A RHEUMATOID PATIENT

"self-sacrificing, conforming, self-conscious, shy, inhibited, perfectionistic"



AFFECTIVE IMMUNOLOGY

- The “Big 5” personality traits (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism) have specific immunological features or defined susceptibility to immune disorders.

Carl Jung and Sigmund Freud were immunologists,
but they did not know it.

- **The study has shown a consistent association between conscientiousness and a reduced inflammatory response, as judged by the lower level of C-reactive protein (CRP) in subjects with this personality trait.**

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Improving Emotional, Spiritual And Mental Resilience

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ILLNESS PERCEPTION

1. **Identity**: the label the person uses to describe the illness and the symptoms they view as being part of the disease.

2. **Consequences**: the expected effects and outcome of the illness

3. **Cause**: personal ideas about the cause of the illness

4. **Timeline**: how long the patient believes the illness will last

5. **Cure or control**: the extent to which the patient believes that they can recover from or control the illness

- Broadbent et al. (2006) -

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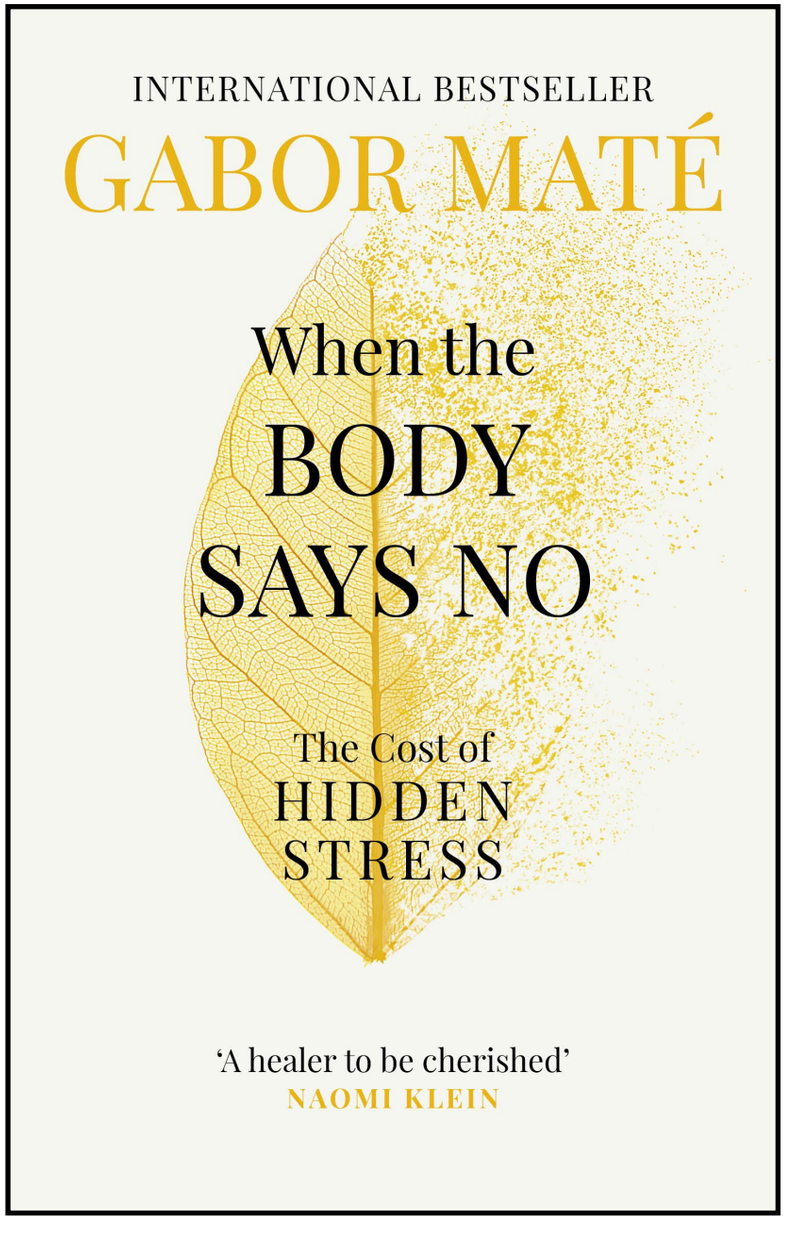
NARRATIVE MEDICINE

Narrative provides meaning, context, perspective for the patient's predicament. It defines how, why, and what way he or she is ill. It offers, in short, a possibility of understanding which cannot be arrived at by any other means."

- Kalitzkus & Matthiessen (2009) -

THE 7 A'S

- Acceptance
- Awareness
- Anger (emotional expression)
- Autonomy
- Attachment (connection)
- Assertion (we are who we are)
- Affirmation (creativity)



MINDFULNESS

- **Intention**: intentional awareness of thoughts
- **Attention**: ability to pay attention in the present, non-judgmentally
- **Attitude**: goal to promote acceptance and self-compassion

RESILIENCE: APPROACH TO PREVENT AND COMBAT BURNOUT IN ONCOLOGY

Mastering Resilience in Oncology: Learn to Thrive in the Face of Burnout

Fay J. Hlubocky, PhD, MA, Miko Rose, MD, and Ronald M. Epstein, MD

OVERVIEW

Oncology clinician burnout has become a noteworthy issue in medical oncology directly affecting the quality of patient care, patient satisfaction, and overall organizational success. Due to the increasing demands on clinical time, productivity, and the evolving medical landscape, the oncology clinician is at significant risk for burnout. Long hours in direct care with seriously ill patients/families, limited control over daily responsibilities, and endless electronic documentation, place considerable professional and personal demands on the oncologist. As a result, the oncology clinician's wellness is adversely impacted. Physical/emotional exhaustion, cynicism, and feelings of ineffectiveness evolve as core signs of burnout. Unaddressed burnout may affect cancer clinician relationships with their patients, the quality of care delivered, and the overall physical and emotional health of the clinician. Oncology clinicians should be encouraged to build upon their strengths, thrive in the face of adversity and stress, and learn to positively adapt to the changing cancer care system. Fostering individual resilience is a key protective factor against the development of and managing burnout. Empowering clinicians at both the individual and organizational level with tailored resilience strategies is crucial to ensuring clinician wellness. Resilience interventions may include: burnout education, work-life balance, adjustment of one's relationship to work, mindful practice, and acceptance of the clinical work environment. Health care organizations must act to provide institutional solutions through the implementation of: team-based oncology care, communication skills training, and effective resiliency training programs in order to mitigate the effects of stress and prevent burnout in oncology.

Dr. A is 11 years past his medical oncology fellowship training and remains motivated to provide the optimal oncologic care for every patient and family member he sees. He works in a vast urban health care system with a patient panel of 110 to 120 patients per week. Dr. A is affable, has a hardy personality, and is admired by patients, nurses, staff, and his partners. Recently, Dr. A became partner, working long hours to achieve this lifelong dream. However, Dr. A is feeling physically exhausted of late, irritable, sad, and ineffective, as it seems as though his clinical duties never cease. At home, he calls his patients and spends most evenings in front of a computer completing patient notes or orders. Dr. A is unable to sleep most nights and spends little time engaging in leisure activities, such as running or attending his son's piano recitals. Currently, Dr. A is on in-patient service and gives weekly hour-long lectures to oncology fellow trainees at an affiliated academic hospital. He reports feeling cynical regarding the future to his colleague Dr. Z and questions, "Is any of this worth it?"

Although the oncology clinician, like Dr. A, is adequately equipped and expert at providing benevolent care to patients with cancer and their families, sadly, the greater majority of clinicians like Dr. A fail to provide self-compassion and care when it is most needed as symptoms associated with burnout arise. Dedicated empathic clinicians like Dr. A respond with self-blame when he is unable to perform at optimal levels. Little if any sympathy has been given to the physician especially the oncologist, who, despite best efforts at "toughing it out," fails to meet all work duties, with his role as physician directly conflicting with his role as parent. As a result, Dr. A feels physically and emotionally depleted, cynical, and ineffective. However, Dr. A may readily face these challenges and address burnout by developing and mastering resilience skills.

A BRIEF OVERVIEW OF BURNOUT IN ONCOLOGY: FOCUS ON RESILIENCE

A comprehensive review and analysis of burnout, including prevalence, symptoms, risk factors, related concepts, as well as individual and organizational interventions for consideration for both the practicing oncology clinician and healthcare institution was presented at the ASCO Annual Meeting in 2016 and documented.[1] A brief succinct overview of the seminal concepts and issues associated with burnout will be presented in this review with a focus on resilience.

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Disclosures of potential conflicts of interest provided by the authors are available with the online article at asco.org/edbook.

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MINDFULNESS

- These findings suggest that acceptance skills training may be a necessary active ingredient.

- How accepting are our clients of their current challenges?

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Psychological Mechanisms Driving Stress Resilience in Mindfulness Training: A Randomized Controlled Trial

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Abstract

Objective: Mindfulness interventions have been shown to reduce stress; however, the mechanisms driving stress resilience effects are not known. Mindfulness interventions aim to teach individuals how to: (i) use attention to *monitor* present moment experiences; with (ii) an attitude of *acceptance* and equanimity. A randomized controlled dismantling trial (RCT) was conducted to test the prediction that the removal of acceptance skills training would eliminate stress-reduction benefits of a mindfulness intervention.

Methods: This pre-registered RCT randomly assigned stressed community adults to one of three conditions: (i) Monitor & Accept (MA) mindfulness training, a standard 8-week MBSR intervention that provided explicit instruction in developing both monitoring and acceptance skills; (ii) Monitor Only (MO) mindfulness training, a well-matched 8-week MBSR intervention that taught monitoring skills only; or (iii) No Treatment (NT) control. Stress and non-judgment were measured using ecological momentary assessment (EMA) for three days at baseline and three days at post-intervention.

Results: Consistent with predictions, MA participants increased in non-judgment and decreased in both stress ratings and the proportion of assessments that they reported experiencing feelings of stress in daily life, relative to both MO and NT participants.

Conclusions: This RCT provides one of the first experimental tests of the mechanisms linking mindfulness interventions with stress resilience. These findings suggest that acceptance skills training may be a necessary active ingredient and support the value of integrating acceptance skills training into stress-reduction interventions.

Trial registration: clinicaltrials.gov; *Identifier:*

[*]Corresponding Author: 342 Baker Hall, 5000 Forbes Avenue, Pittsburgh, PA; cresw ellacmu.edu.

Author Contributions

JDC developed the study design, with feedback from all study authors. JDC, CG, and EL developed the MO intervention. BC performed the data analysis and interpretation, with feedback from EKL, KWB, JMS, AW, and JDC. BC and JDC drafted the manuscript. All authors provided critical revisions and approved the final version of the manuscript for submission.

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MINDFULNESS EXERCISE

THE COFFEE MEDITATION

SAVOURING

Savouring is the ability to focus one's attention on positive experiences and to modify one's thoughts and behaviours in ways that intensify and prolong positive feelings.

Brief Report

SGS SOUTHERN GERONTOLOGICAL SOCIETY

Journal of Applied Gerontology
1–16

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SAGE

Effects of a Savoring Intervention on Resilience and Well-Being of Older Adults

Jennifer L. Smith[1] and Agnieszka A. Hanni[2]

Abstract

Savoring is the ability to be mindful of positive experiences and to be aware of and regulate positive feelings about these experiences. Previous research has found that savoring interventions can be effective at improving well-being of younger adults, but findings have not been extended to older populations. This pilot study examined the effects of a 1-week savoring intervention on older adults' psychological resilience and well-being (i.e., depressive symptoms and happiness). Participants, 111 adults ages 60 or over, completed measures of resilience, depressive symptoms, and happiness pre- and postintervention as well as 1 month and 3 months after the intervention. Analyses revealed that participants who completed the savoring intervention with high fidelity also reported improvements in resilience, depressive symptoms, and happiness over time. These findings suggest that the savoring intervention has the potential to enhance older adults' resilience and psychological well-being.

Keywords

emotion regulation, positive emotion, depression, happiness, intervention

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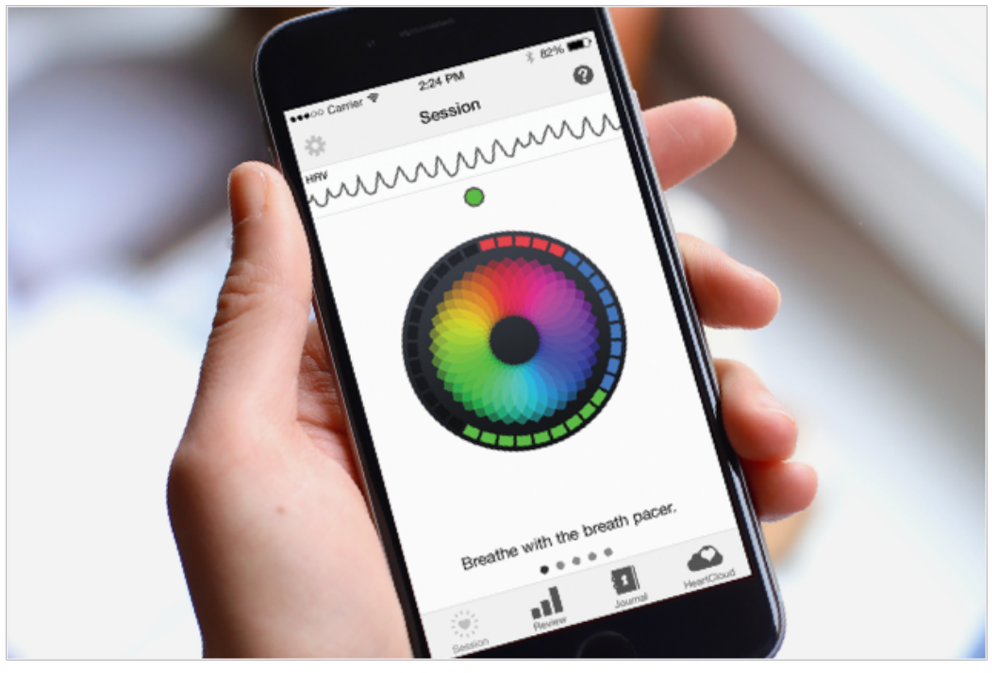
EMOTIONAL RESILIENCE
HEARTMATH INSTITUTE

"A key to sustaining good health, optimal function and resilience is the ability to manage one's emotions."

"The most important skill the majority of people need to learn is how to increase their capacity to self-regulate emotions, attitudes and behaviours".



VALUES

"He who has a why to live can bear almost any how."
Friedrich Nietzsche

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- In terms of possible mechanisms, connecting to personal values may be a way for people to motivate themselves to actively deal with challenging life events. Values provide a reason to keep going, especially when life events make it hard or impossible to live in line with personal values.

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GRATITUDE JOURNALING & EXPRESSIVE WRITING

- Expressive writing results in significant improvements in longer-term physical health outcomes such as illness-related visits to the doctor, blood pressure, lung function, liver function and number of days in hospital

- Expressive writing has also produced significant benefits in a number of measures of immune system functioning

HEALTH OUTCOMES	SOCIAL AND BEHAVIOURAL OUTCOMES
Fewer stress-related visits to the doctor	Reduced absenteeism from work
Improved immune system functioning	Quicker re-employment after job loss
Reduced blood pressure	Improved working memory
Improved lung function	Improved sporting performance
Improved liver function	Higher students' grade point average
Fewer days in hospital	Altered social and linguistic behaviour
Improved mood/affect	
Feeling of greater psychological well-being	
Reduced depressive symptoms before exam-	
Fewer post-traumatic intrusion and avoidance symptoms	

Advances in Psychiatric Treatment (2005), vol. 11, 338–346

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Tools To Build Resilience

PHYSICAL	MENTAL	SPIRITUAL	EMOTIONAL
Nutrition	Self-Efficacy/ Autonomy	Values	Relationships (social support)
Fasting	Humour	Art	Hope
Exercise	Competence	Purpose	Reflection
Light	Reflection	Mindfulness	Gratitude
Cold/Sauna Therapy	Savouring	Creativity	Compassion
Nature	Optimism	Breathwork	Journalling
Self-compassion (Mindfulness)			

QUESTIONS TO REFLECT UPON

- Can we run consultations in natural environments?
- Can we incorporate some of these concepts and questions in to our intake forms?
- Can we consult the family, or partnership, rather than than the individual?
- Can we offer consultations in more natural settings?
- How is the way we are living our life (i.e how resilient are we?), influencing how we practice?

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THANK YOU

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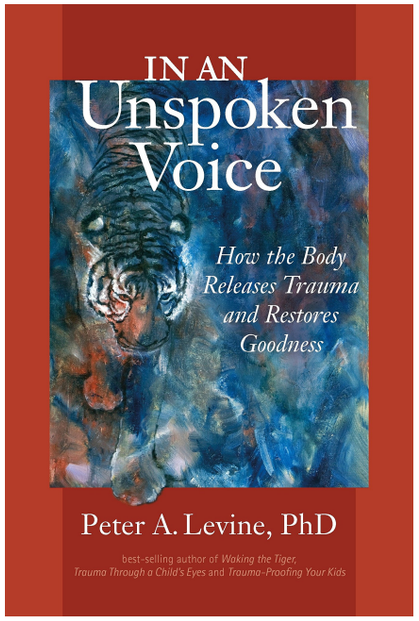
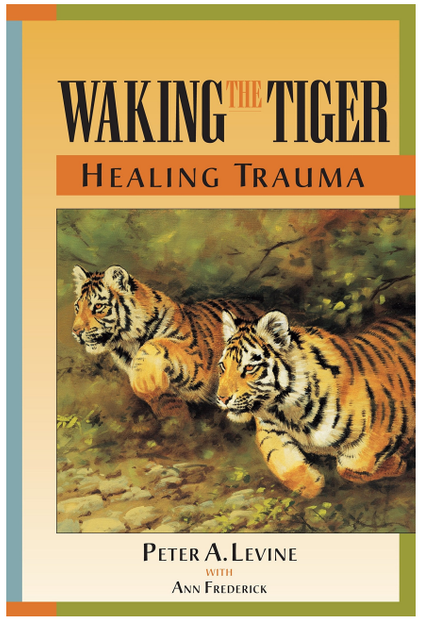
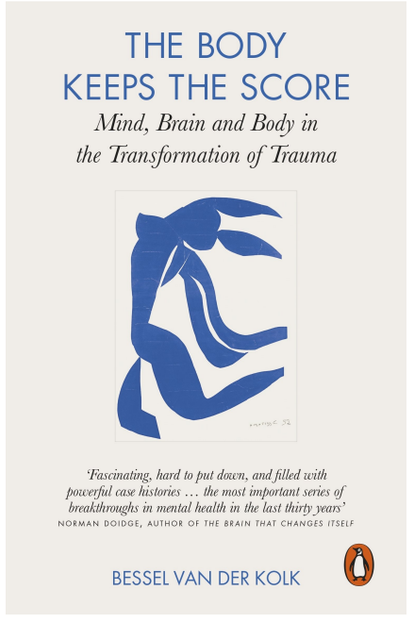
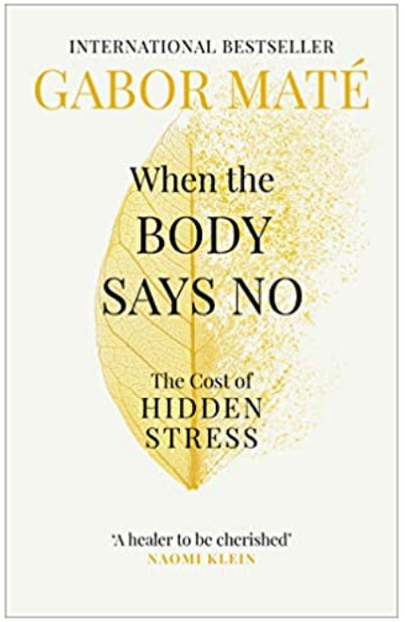
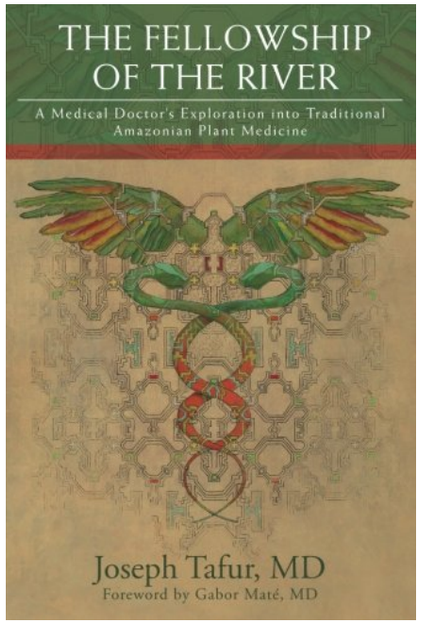
Resources

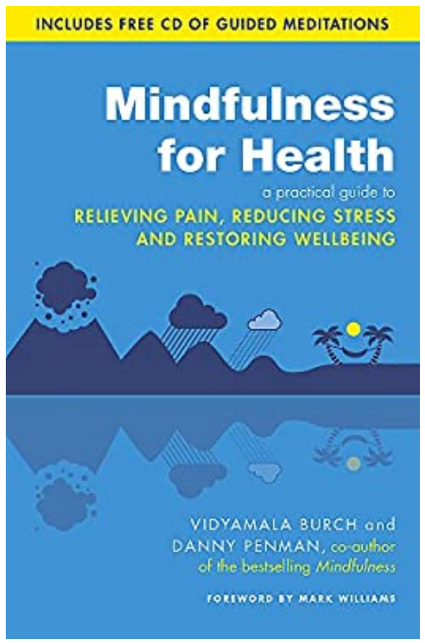


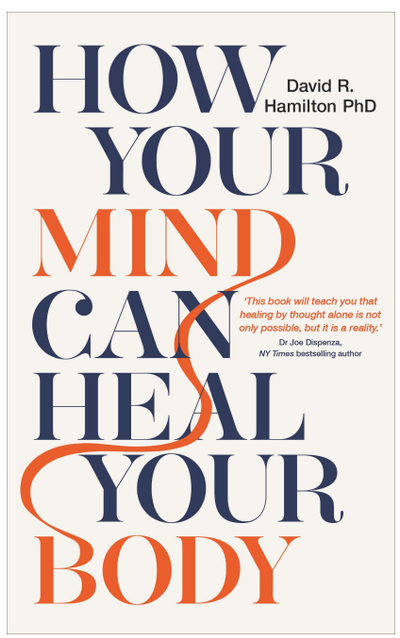


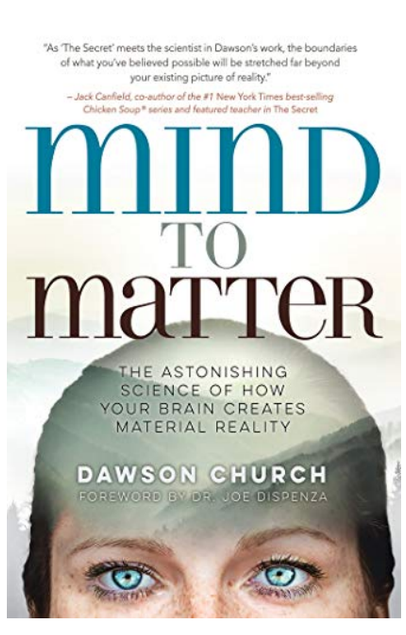


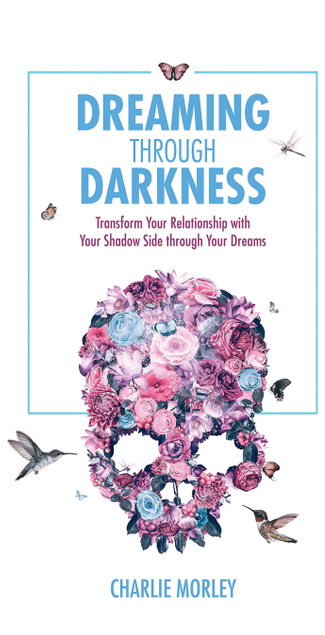


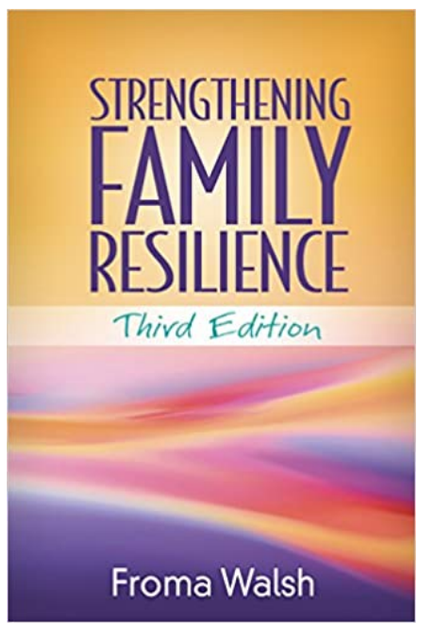












More at: https://www.alexmanos.co.uk/alexs-library/