

Cape Cod Institute

June 26-30, 2017

9:00am-12:15pm

Bouncing Back:

Rewiring the Brain for Resilience and Well-Being

Monday, June 26

[resilience, PFC, attachment, NP, mechanisms, intelligences]

9:00am

S-1 Title

Welcome; Cape, Cape Cod Institute; Bouncing Back

Welcome to a week of learning for our clients, for ourselves, about resilience, capacities to face and cope skillfully with disappointments, difficulties, even disasters.

We'll learn how resilience develops in the first place, how those capacities can get de-railed, and what neuroscience can teach us about how to help clients, and ourselves, strengthen and recover those capacities, get the full range of resilience back on track.

I'm going to create a framework for our week of learning together, a context here first, have you introduce yourselves to each other before the break so you can find people with common interests, working with similar modalities or with similar populations, so you can meet and have lunch or go for a walk on the beach or meet for the whale watching.

S-2 image of head bowed, arms up in triumph

This training draws on a confluence of wisdom from many disciplines, many paradigms, behavioral science research on how people learn to be resilient, what's known as growth mindset evolving into post-traumatic growth, modern psychology and psychotherapy, especially relational psychology and attachment theory, how resilience develops in the psyche in the first place; discoveries of modern neuroscience about how resilience develops in the brain in the first place, practices from positive psychology, from Eastern spiritual traditions, from body-based trauma therapy, that increasingly synergize and interweave together in very practical ways to help us come into the equanimity, inner peace, contentment and well-being that is the practical outcome of resilience.

1) streamlined and saturated

Excellent format - morning training, afternoon-evening to reflect, digest metabolize, integrate

Been here before? Activities, play, walk beach, good food, good company, settle in and savor, install in memory

2) brain learns from experience

Experiential workshop, especially Tuesday-Friday

Principles and mechanisms

Tools and techniques

Experience for ourselves; more conviction with clients

Who love to learn how the brain works;
competence, mastery

3) Brain learns best interacting with other brains

Eye contact

Emotional resonance

Shared reflections and insights

Some today, many in next four days

Encourage Q&A - learn from each other

Depth, relevance, jazz riff, not case consultation

Handouts to follow along, take exercises, references, links home

S-3 LG intro

I can give my standard introduction of myself here: as a psychotherapist for 25 years I care very much about people finding their own authentic true sense of self, healing any patterns of behavior or beliefs that would derail their resilience and well-being or derail healthy relating with other people. And from teaching many, many trainings and workshops now, nationally and internationally, I know that everyone, ourselves, our clients, has faced or is coping now with some difficulty that challenges our resilience; it's part of the human condition.

I draw on many modalities and 25 years of experience to do this work and teach these workshops. I also teach Mindful Self-Compassion in the San Francisco Bay Area, including at Spirit Rock Meditation Center, to help people be with their experience more fully and accurately to see clearly and make wise choices.

I wrote the book *Bouncing Back* (available through the bookstore) to integrate neuroscience with the practices of mindfulness and relational psychology so readers could learn what tools and techniques are empirically validated by modern neuroscience to rewire the brain and thus change behavior in ways that are safe, efficient, and effective.

I post monthly e-newsletters and weekly resources for recovering resilience that are free, easily downloadable, actually useful and helpful. Sign-up sheet in the back.

Now under contract to write a guidebook to Bouncing Back, working title of Resilience Is Our Birthright: Practical Tools for Bouncing Back from Disappointment, Difficulty, even Disaster, to be published by New World Library in 2018.

S-4 Q Keller

All the world is full of suffering; it is also full of overcoming.

- Helen Keller

So, we begin with focus on resilience, all in the context of this quote from Helen Keller.

How we cope with disappointments that happen every day, losing our wallet and car keys, discovering mold in the bathroom, missing three days at the office to care for a sick child, difficulties that happen every day, disruptive, unwanted changes of the washing machine going on the fritz or the car needing a new transmission.

BIG disappointments and difficulties that are an inevitable part of being a human being that happen over a lifetime, infertility or infidelity, a diagnosis of pancreatic cancer, losing a job, a son wounded in combat overseas. Even with disasters that threaten to completely upset our life as we know it, or the lives of those we love and care about, meaning and purpose and values that we care about.

Sometimes too many things go disastrously wrong all at once: a daughter arrested for selling pot, a laptop left on a plane, finding out that the contractor repairing the roof is being sued for shoddy construction work, all in the same week they are placing an aging parent in a nursing home. We begin to feel like we are drinking from a fire hose and about to go under.

If we or someone we care about loses a job, or loses a relationship, or loses our home, or our health, or our hope, how do we bounce back from the challenges, even disasters inevitable in the human condition?

Why DO some people cope with potentially traumatizing events better than others, what are the factors that help people cope more resiliently?

S-5 Resilience used to be trait, shifting to perception

Resilience used to be thought of as inborn traits of hardiness, grit, determination, the will to endure and survive. That is shifting to the role our own perceptions and choices play in strengthening our resilience. How we choose to perceive the event and how we perceive ourselves in relationship to the event.

This may be a good place to distinguish stress and stressors. Stressor, external event like everything we've mentioned above,

or internal message about that event triggers stress response in body. The familiar fight-flight-freeze to get us moving out of danger, or the numbing out-collapsing to hide from danger.

Resilience is managing our own stress response to an external event, or to an internal message about that event, or about ourselves in relationship to that event, so that we have the strength and clarity and choice to cope with the event itself.

So resilience is developing adaptive responses to stressors, whatever those external events or internal messages about those events might be, and skillful management of our internal stress response.

The key capacity for resilience is the capacity of response flexibility. The capacity to shift gears, shift perspectives, to shift our attitude and our approach to whatever is happening that we wish wasn't happening, to whatever is disturbing or distressing to us, whatever seems potentially tragic or traumatizing to us.

We've probably seen for ourselves that different people can respond differently to the same event; one person loses a job and gets derailed in their career for six months; another person loses a job and within two months has found a new career path. Even the same person can experience the same event at different times in their life, a car accident or a health diagnosis, and depending on how resourced they are in their lives at the time, can respond differently, in trauma or as an opportunity, to the same issue.

I experienced this myself, many years ago, when I was diagnosed with osteoporosis. At first I simply fell apart, I couldn't believe, with as athletic and healthy with my nutrition as I had been all my life, that I could have osteoporosis. But my friend Erin, who was a nurse, said, "Linda, if you do what you have to do to strengthen your bones now, even with the osteoporosis, you'll be healthier in a few years than you are now." She was right, and I did, and I am. That diagnosis, which could have been traumatizing, became a growth opportunity for me.

This perspective shifts the responsibility for coping with a trauma to someone's perception of the event and to their perceptions of themselves in response to the event.

S-6 New Yorker, Growth Mindset, PTG

There was a wonderful article in the February 11, 2016 issue of the New Yorker last winter: "How People Learn to Become Resilient." That summarized a lot of the recent research about resilience. Including Carol Dweck's book Mindset, based on her research (at Columbia at the time) of fixed mindset v. growth mindset. Dr. Dweck found that people with a fixed mindset tended to believe success at something should come easily to them if they were smart or talented and when faced with a setback or a failure - loss of a job or rejection from graduate school - people with a fixed mindset tended to give up, they

became passive and stopped trying, often with many rationalizations or excuses for their refusal to make any effort. On the other hand, people with a growth mindset or more accurately people who choose to cultivate a growth mindset think of their own effort and perseverance as the key factors in their learning, growth, and ultimately success and are willing to try, even try and fail, until they reach their goal.

When we apply the framework of fixed mindset v. growth mindset to our work with trauma survivors, we are helping them, requiring them really, to shift from a victim stance, poor me, this terrible thing happened to me to a more empowered agentic stance - I can deal, I can make a difference, I can figure this out.

How long should you try? Until. - Jim Rohn

The difference between try and triumph is a little "umph." – author unknown

The greatest oak was once a little nut that held its ground. – Author unknown

The article also refers to the recent research on post-traumatic growth, which is adding a great deal to our understanding of resilience. With key findings that while 75% of all Americans will experience at least one potentially traumatizing event in their lifetime, only 8% will develop full-blown PTSD, more

than 50% of people completely recover from completely upheaving event; new strengths, new purpose, deeper relationships, deeper appreciation for life because of process of recovery from event. We'll explore post-traumatic growth a lot more on Friday under reflective intelligence.

S-7 Q Bonano, Perez, Zinn

In that article was this quote from George Bonano, director of the loss, trauma, and emotion lab at Columbia University:

Do you conceptualize an event as traumatizing or as an opportunity to grow.”

Similar wisdom expressed by Frankie Perez:

How you respond to the issue...is the issue.

And Jon Kabat-Zinn, developer of Mindfulness-Based Stress Reduction:

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

S-8 Q Darwin

It is not the strongest of the species that survives,

nor the most intelligent that survives.

It is the one that is the most adaptive to change.

- Charles Darwin

S-9 Q Frankl

Between a stimulus and response there is a space. In that space is our power to choose our response. In our response lies our growth and our freedom. The last of human freedoms is to choose one's attitude in any given set of circumstances.

- Viktor Frankl, Austrian psychiatrist,
survivor of Auschwitz

S-10 Q Friedman-Hill-Siegel-Perez-Kabat-Zinn

- Catch the moment; make a choice
 - -Janet Friedman
- Every moment has a choice; every choice has an impact
 - - Julia Butterfly Hill

Shoes in wet cement story

Here's a story from my own experience that perhaps illustrates how we can bounce back from difficulties and take

responsibility for shifting how we cope with challenges, overcome suffering and learn to sail our own ship.

When I had an office in the Sunset neighborhood of San Francisco, I would park my car in Golden Gate Park and walk the two blocks to my office, something I could do on automatic pilot.

One day, more distracted than usual mulling over something I was worried about, I wasn't paying enough attention to where I was walking and blithely stepped into a sidewalk of freshly laid wet cement - up to my ankles.

The cascade of critical thoughts erupted immediately, "You stupid klutz! Look what you've done! You've ruined your shoes! Now you'll be late to work; you'll have to cancel clients today; you'll probably lose clients over this. How could you!" The whole deep slide into the rabbit hole of shaming-blaming-catastrophizing.

Fortunately, by then I had enough mindfulness and self-compassion practices under my belt to catch up to myself. "Whoa! Wait a minute! I need to shift my entire approach here! I'm not the only person on the planet who made a mistake today just because they weren't paying attention. This is probably not the only mistake I'm going to make today. I need to slow down

here, collect myself, try to be a little kinder to myself right here, right now, step out of this sidewalk, and deal.”

With that shift in attitude and shift in response, I did pick my feet up out of my shoes and pick my shoes up out of the cement.

There happened to be an apartment building with an outdoor water faucet just a few steps away. As I began to wash off my shoes, I began to think a little more clearly. “This happened. Other than my own embarrassment and my own inner critic wailing the hide out of me, there’s no catastrophe here. Shit happens. This happened. I’m dealing with it as best as I can. This is going to be okay.

As an on-site construction worker came over to me with some paper towels to wipe off my shoes (I’m grateful to this day for his kindness - no teasing or taunting, no further embarrassment) I began to have some hope that I could save my shoes (I did). I also began to have a little pride and a lot of gratitude that I was coping as well as I was.

Then came the big shift. “Yeah, shit happens, but shift happens, too. If I can shift my attitude in these circumstances, I can shift my attitude in any circumstances.” That’s the big shift.

S-11 Shit Happens. Shift Happens

Shit happens. Shift happens. If I can shift my response in this moment, I can shift my response in any moment. That's the big shift. And modern neuroscience helps us understand the neuroplasticity that supports our capacities to respond flexibly to challenges and crises in life that make that shift possible.

Exercise Individual reflection, journaling, groups of three:

Any place where you did shift perspectives? Shift response?

S-12 Group intro's

Group Intro's

Name, where from, work you do, capacity you would most like to focus on this week to strengthen your resilience?

Calm, Compassion, Connections, Clarity, Curiosity, Courage, Creativity, Competence

S-13 image of brain

Beginning to pull in some of the neuroscience to help us recover our resilience:

Resilience IS a capacity innate in the brain; it is a capacity of the pre-frontal cortex (the area in red on the slide) - the brain's center of executive functioning that gives us the capacity for response flexibility - to shift gears, shift perspectives, see options that we couldn't see before. The response flexibility - innate in our brains - to shift out of very automatic, habitual reactivity of our survival responses into a more skillful, flexible responsiveness to whatever is happening that we wish wasn't happening, to whatever is disturbing or distressing to us to whatever seems potentially tragic or traumatizing to us. That capacity to create shift can be learned, cultivated and strengthened, and we can do that by strengthening the functioning of the pre-frontal cortex. Strengthening the pre-frontal cortex is what will allow us to create new patterns of response and rewire old ones.

We know the pre-frontal cortex as the center of executive functions like planning, judgment, decision making, etc. But it is much more than that.

S-14 Functions of Pre-Frontal Cortex

The full maturation of the pre-frontal cortex (the area you see in red on your screen) is what allows our brain to regulate the body and the nervous system, to keep it in a baseline physiological equilibrium known as the "window of tolerance", not too revved up, not too shut down, able to be relaxed, relational, and resilient. The pre-frontal cortex is what manages a broad range

of emotions - joy and sadness, shame and guilt, love and trust, and it especially down-regulates the survival fear and anger responses of the amygdala.

When the pre-frontal cortex is fully developed and fully functional, meaning it can integrate input from many, many different parts of the brain and create coherent responses to those inputs, we can attune to our own physical and emotional experience in response to a dangerous, toxic or life-threatening situation, and we can attune to the physical and emotional responses of other people as well. We can empathize with - understand, accept, and make sense of - our own responses and understand, make sense of, other people's response, too, even if we don't agree with them.

We can use all of these functions working together to make all kinds of executive decisions, plans, analyses, judgment and discernments. The pre-frontal cortex is also essential to developing an ongoing self-awareness, knowing who we are and how we fit in with other people around us, as we move through time and evolving phases of our life. PFC most integrative structure of brain.

And, the pre-frontal cortex IS the structure in the brain we rely on the most to utilize our innate capacity for response flexibility.

It IS the CEO of resilience, to perceive our own perceptions, catch our own filters and beliefs, or blocking beliefs, about our circumstances, and to use all the tools and techniques that allow us to shift those perceptions and beliefs when necessary

S-15 Attachment Kindles Maturation of Pre-Frontal Cortex

People will develop that inner secure base of resilience - or not- in their earliest attachment relationships. Researchers have found that secure attachment provides the best buffer the brain has, and we have, against stress, trauma and later psychopathology. And when early attachment experiences are less than secure, even damaging to the development of the brain, then people are much, much more vulnerable to stress, trauma and later psychopathology.

I wrote my book *Bouncing Back:; Rewiring Your Brain for Maximum Resilience and Well-Being* to help readers deal primarily with attachment trauma - the derailing that happens when interactions with people around us, especially early on, don't foster the capacities in our brains and psyches to regulate our nervous system, our emotions very well, don't get the inner secure base of relational trust and resilience that we need to cope with the disappointments, difficulties, even disasters of life.

The new field of interpersonal neurobiology developed by Dan Siegel at UCLA helps us understand this.

Human beings are born with a biological imperative to connect with people close to them - caregivers initially - for safety and protection, for comfort, calming, and soothing, over time for the intersubjective connection of being seen, mirrored, understood, validated, accepted, that develops the nascent sense of self. Human beings don't have to learn how to do this reaching out; that is hard-wired in by evolution.

Matthew Lieberman, a neuropsychologist at UCLA, says in his book *Social: Why Our Brains Are Wired to Connect*:

This is what our brains are wired for: reaching out to and interacting with others. These are design features, not flaws. These social adaptations are central to making us the most successful species on earth....Increasing the social connections in our lives is probably the single easiest way to enhance our well-being.

Because our experiences in our earliest attachment relationships so powerfully provides that kind of felt-sense of empathy - or not, and those experiences so powerfully develop - or derail - the inner secure base of resilience, and even so powerfully kindle - or derail - the maturation of the pre-frontal cortex of the brain, which is the structure of the brain we use the most for our

resilience - regulating the nervous system, managing emotions, empathizing with ourselves and others, cultivating self-awareness and self-acceptance, and supporting our response flexibility - I want to spend a little time here exploring how secure or insecure attachment affects our sense of self, our capacities to relate to others, and the brain's capacities for resilience, and then learn how to heal into an earned secure sense of attachment again.

Attachment styles are basically the conditioned patterns of regulating emotions, relating to others and responding to life events learned in our earliest attachment relationships and they are imprinted in our neural circuitry by 12-18 months of age. They are installed without the client's conscious choice in the matter and without intervention, they operate out of awareness well into adulthood.

All attachment styles begin developing when the baby-child experiences a fear or a startle and reaches out to a caregiver for that safety and comfort.

S-16 Responsive Parenting - Inner secure base

In the responsive parenting that creates secure attachment:

the parent is available, present, predictable, sensitive, focuses attention on baby, emotionally attuned, empathically resonant,

contingently reflective of baby's inner reality, reciprocally communicating in tones, gestures, facial expressions as well as words, engagement-disengagement follows baby's lead, able to hold-process-regulate baby's affects (soothe distress, amplify joy), effective in interactions.

That's everything we want to do with our children to create the safety of a secure attachment bond that will prime the neuroplasticity of the child's brain for learning and growth.

And the developing baby-toddler-child (or our client) gets to feel safe and protected, feel "felt" in own reality; feel their affects regulated and soothed; they learn to self-soothe; develops trust of caregiver (or therapist) as safe haven, internalize mother or father (or therapist) as source of comfort, seek connection, trusts own capacities to activate response; expect others to be attentive, helpful, encouraging of autonomy; flexible focus on self-other-world.

S-17 Stable/Flexible Adult (and Brain)

And that leads to traits/behaviors as an adult; people can believe relationships are generally safe and people are generally helpful; comfortable with emotions, intimacy, inter-dependency; tolerate relational frustration well; optimistic about relationships lasting and being satisfying.

A hallmark of secure attachment is a well-functioning pre-frontal cortex, both stability and flexibility of focus on self, other, and the world. A hallmark of a healthy integrated well-functioning brain is to be both stable and flexible in its processing. What Dan Siegel refers to in his acronym FACES: the brain and the person is flexible, adaptive, coherent, energized, and stable. That includes response flexibility, the neural substrate of resilience. That is the base that provides the best buffer we have against stress, trauma, and later psychopathology. That is the foundation of well-being. So we are always balancing the functioning of the brain to be both stable in coping and flexible in coping. That's it.

S-18 Dismissive Parenting - Insecure Avoidant

When a parent has a dismissive style of attaching, meaning they are indifferent, distant, neglectful, absent, rejecting, shaming, blaming, critical, judgmental, physically-emotionally unavailable, ineffective in regulating affect

Then the developing infant-toddler-child withdraws from interactions, seemingly indifferent to caregiver; doesn't seek or expect comfort or soothing; defensive exclusion of affects (numbing out); Focus on self or world, not other.

S-19 Avoidant Adult - Rigid Brain

And that leads to traits/behaviors as an adult of being emotionally shut down; devaluing relationships and feelings; uncomfortable with intimacy, vulnerability, dependency.

Someone with an avoidant style of attachment and coping can focus on themselves, all right, but are more likely to avoid focusing on other people and the emotions that other people might evoke that might be unsettling or disturbing. So they can tend to be defensive, rigid in their style, not open to learning, not open to change. And this impacts the functioning of their brain, too, people with an avoidant style can have what Dan Siegel's protégé Bonnie Badenoch calls "neural cement". Experiences that don't fit into the templates of what is already known and familiar can be rejected. The brain is not flexible and open to learning. PFC doesn't develop enough response flexibility.

S-20 Unpredictable Parenting - Insecure Anxious

When caregivers are inconsistent, unpredictable, sometimes attentive and loving, sometimes harsh or punitive, sometimes over-involved, sometimes off in their own world;

The developing child is insecure about reliability of caregiver for safety-protection; not easily soothed; ambivalence: sometimes clingy and possessive, sometimes angry-defiant. Internalization of anxious mom. Focus on others, not on self

S-21 Anxious Adult - Chaotic Brain

As an adult is subject to abandonment fears, chronic vigilance about attachment-separation, emotional dysregulation and anxiety, passivity and lack of coping; victim stance

Someone with an insecure anxious or ambivalent style does focus on the other in an anxious way, do you like me what can I do to please you, but not focus on themselves so much. The inner sense of self remains a bit inchoate, ungelled, a little chaotic. What Bonnie refers to as “neural swamp.” Learning happens, but it tends to wash through like water through a sieve. And the same lessons need to be learned again and again. Too much flexibility, not enough stability in PFC.

Attachment patterns are encoded in implicit memory by 12-18 months of age, primarily in the right hemisphere, primarily in the form of body sensations, emotional sensations, visual images, and the felt sense of safety or danger in relationship to other people.

This means attachment patterns are encoded below the level of awareness and are primarily non-verbal. An example given by Dan Siegel to illustrate the power of implicit memory to shape our behavior is that is you were badly bitten by a dog when you were six years old, you would have a conscious memory of the incident, and would know the reason why you might have a

reaction of fear when you encountered another dog later. But if you were badly bitten by a dog when you were six months old, you might also have a strong fear reaction the next time you saw a dog, but unless your parents told you the story of being bitten before, you would not know consciously why you would be scared of dogs now. Our early unconscious memories of safety or danger in our early relationships can have a similar out of awareness impact on our experiences in relationship now.

S-22 Unresolved Trauma/Abuse - Disorganized

When parents are still unresolved in their own trauma or grief, they can appear to the child as fragmented, disorganized, dissociated; frightening, bizarre, abusive, traumatizing

The developing child experiences what is called “fright without solution” and experiences feeling helpless, paralyzed, fragmented, chaotic dissociated; cannot focus, cannot soothe

S-23 Disorganized - Fragmented, Dis-Integrated Brain

The paralysis, lack of focus, dissociating in disorganized clients is especially problematic. There’s dis-integration of functioning in the brain, sensations and emotions of the lower brain are not regulated by the higher brain. Learning and wisdom of the higher brain are not available to parts split off, compartmentalized, repressed. The pre-frontal cortex, center of

executive functioning, is not able to perform its functions of attunement, empathy, self-awareness, or response flexibility very well. When PFC is so disconnected from lower brain, it can't purge amygdala of bad memories.

S-24 Adverse Childhood Experiences - Developmental Trauma Disorder

Go even one layer deeper, impact of attachment process on brain and capacities for resilience and coping.

The Kaiser ACEs study in the late 1990's identified Adverse Childhood Experiences - physical, sexual or psychological abuse, neglect, exposure to violence in the home - that could lead to what attachment researchers would categorize as disorganized attachment, the paralysis of "fright without solution" that can lead to more fragmentation and dissociation, that can lead to impaired brain development, impaired cognitive development and impaired social-emotional skills making it far more difficult to cope with anything. Too many adverse childhood experiences could lead to what Bessel van der Kolk would like to have included in the DSM as developmental trauma disorder. Developmental trauma requires a comprehensive trauma therapy to address the damage done to the brain as well as to the psyche: Sensorimotor Psychotherapy, Somatic Experiencing, EMDR. (Which would be another workshop.)

S-25 Trauma Therapy is Body-Based

- Bessel van der Kolk
 - *The Body Keeps the Score*
- Peter Levine
 - *In an Unspoken Voice*
- Pat Ogden
 - *Trauma and the Body*
- Babette Rothschild
 - *The Body Remembers*
- Robert Scaer
 - *The Body Bears the Burden*
- Somatic experiencing, Sensorimotor, yoga, chi gong

S-26 Q Levine

Q Trauma is a fact of life. It doesn't have to be a life sentence.

- Peter Levine

Q&A

S-27 Paul Gilbert

I'll introduce another link between resilience and neuroplasticity and how we can begin to rewire less than secure attachment styles with a framework offered by Paul Gilbert, developer of Compassion Focused Therapy in the U.K., because I have found his framework very useful with people who are caught in coping strategies that are less than resilient, that are maladaptive in some way, or stuck in shame or guilt because of those behaviors. People get this framework pretty quickly, and it shifts the work of recovering resilience into a pro-active approach to change, growth, and healing from the very beginning.

Paul says:

Given the evolutionary development of the human brain over hundreds of millions of years, and...[meaning unless there is organic impairment, we are all hard-wired with the same automatic survival responses of autonomic nervous system, the same negativity bias of the right hemisphere of the cortex, the same vulnerabilities to stress hormones killing brain cells in the structures that encode experience into long-term memory]

Given the genetic templates any of us have inherited from generations of ancestors, and...[can be multi-generational transmission of trauma]

Given the conditioning of our attachment experiences in our family of origin, optimal or less-than-optimal, and...[we just learned: we depend on being regulated by other people early on to learn how to regulate ourselves, and the development of the pre-frontal cortex, the center of executive functioning, is kindled and shaped in our earliest attachment relationships]

Given the norms and expectations of our culture and our society... [whether we learn to have realistic expectations of our capacities or not] And there can be intergenerational transmission of trauma.

Who we are...and how we cope...is not our fault.

This kernel of wisdom can be a tremendous relief to anyone who feels stuck and feels badly about feeling stuck. There are so many forces that converge and shape who we have become as an individual human being. No matter how dysfunctional our client's behaviors or how stuck they feel in them, everything they think and do and feel has a reason that is fundamentally understandable, and as we shall see, fundamentally workable.

Then Paul goes on to say...

S-28 given neuroplasticity....

Given neuroplasticity, and especially given the power of our choices of self-directed neuroplasticity, who we are and how we cope becomes our responsibility.

Through knowing how to harness our neuroplasticity, we can strengthen the functioning of certain brain structures when we know how to, can influence the expression of genes, can rewire patterns learned in family of origin conditioning, can rewire patterns learned from our culture and society. We choose experiences that strengthen the functioning of the PFC, strengthen capacity of response flexibility, recover and strengthen our resilience.

Neuroscience - Neuroplasticity

The discoveries of neuroscience - and neuroplasticity is the greatest discovery of modern neuroscience - helps us take responsibility for changing our behavior and coping strategies that will lead us to more resilience and well-being.

Modern neuroscience can be said to be research on the structures of the brain, what neural structures and circuits even are.

S-29 Brain factoids

100 billion neurons

Most diverse cell in human body - 150 types

Each contains entire human genome

Each fires hundreds of times per second

Each neuron in PFC connected to 15,000 other neurons

Trillions of synaptic connections

More connections in single cubic centimeter of brain tissue than stars in Milky Way galaxy

Boggles the mind to contemplate the brain

S-30 Image of brain

Learning how those structures of the brain develop and communicate with one another to maintain health and homeostasis of body.

Lower brain, brainstem and limbic - fast, unconscious, limited

Higher brain, cortex - slow, conscious, comprehensive

How the brain functions to process information from experience and generate adaptive - meaning life saving and then life-enhancing - responses to experience, how the brain learns its patterns of coping in the first place, and how it rewires them. Increasingly, to understand how social the brain is. The brain's full development and maturation of integrative functioning - of self-regulation of the body and emotions, and relating to others

skillfully resonantly, and reflection on experience of self, other and the world - depend on interactions with other brains in networks we would call family and the human family.

Broadly speaking, neuroplasticity means the brain can change and grow lifelong. This was not obvious for the first 150 years of modern neuroscience. Genetic determinism held sway for a long time in modern neuroscience - that the brain developed according to genetic blueprints on a pre-determined timetable and that the environment did not -could not- influence that development.

While preparing this presentation I had the opportunity to watch a documentary “My Love Affair with the Brain” about Dr. Marion Diamond, professor of neuroanatomy at U.C. Berkeley for 55 years (she retired at age 85) and her research that began the shattering of that paradigm of genetic determinism. Dr. Diamond’s research on the impact of an enriched environment on the growth of cortical brain cells in and the decrease in the cortical brain cells in an impoverished environment, published in 1964, was the first replicable scientific evidence of neuroplasticity in mammalian brains. Her research began the irrevocable shift of the entire brain science paradigm.

It still took more than a generation of further research to completely shift that paradigm. The wisdom of the previous scientific tradition still held that once a brain fully matured,

about 25 years of age, that the brain couldn't change much after that. You couldn't teach an old dog new tricks.

But about 25 years ago the technologies that could scan living human brains - fMRI's, PET scans, EEG's - became sophisticated enough to actually map the firing of individual neurons, to map the pathways of communication across synapses and to trace the networks that cause various structures of the brain to communicate with each other, and to measure increases or decreases in brain cell volume based on activities or experience. Does a particular practice strengthen brain functioning or not?

And neuroscientists like Norman Doidge began making those emerging discoveries available to us in books like *The Brain that Changes Itself* and *The Brain's Way of Healing*. Now we know that that the brain changes, develops, and repairs itself lifelong.

S-31 Neuroplasticity

That the brain can grow new neurons lifelong; that the brain can strengthen the connections among those neuron across the synaptic gap lifelong; that the brain can myelinate the pathways connecting one neuron to another, making the processing of information up to 1,000 times faster; that the brain can create and alter neural circuitry, even re-organize the functioning of

brain structures lifelong. And that is, without doubt, the greatest discovery of modern neuroscience.

Neuroscientists are now researching the large-scale mapping of patterns, rules, models of behavior, memories and meanings of events, held in broad reaching networks, what they call the human connectome, like scientists mapped the human genome or studied the human microbiome.

Example: how we find our car in a parking garage

S-32 Mendius

Q Mendius: The field of neuroscience is so new, we must be comfortable not only venturing into the unknown but into error.

What neuroscientists don't know, and all agree, don't know, is how physical brain gives rise to phenomenon we know as consciousness. What we can experience so clearly in mindfulness practice. No clue.

S-33 Q Davidson

The brain does learn from experience, that's how all learning and development in the brain happens.

Richard Davidson, whose lab, the Center for Investigating Healthy Minds at the university of Wisconsin-Madison has generated much of the data demonstrating the impacts of self-directed neuroplasticity on brain structure and brain functioning, says,

The brain is shaped by experience. And based upon everything we know about the brain in neuroscience, change is not only possible, but is actually the rule rather than the exception. It's really just a question of which influences we're going to choose for the brain. And because we have a choice about what experiences we want to use to shape our brain, we have a responsibility to choose the experiences that will shape the brain toward the wise and the wholesome.

In the words of my friend and colleague, Rick Hanson, we train the mind to change the brain to change the mind for the better.

Neuroplasticity - the brain learns “little and often”

And for now, it's incremental changes - little and often - that will do that the best. Research shows clients will retain the learning from a new experience better if they practice something in small doses and then repeat, repeat, repeat. Little and often creates the incremental changes in the brain's circuitry that leads to lasting changes in behavior. Baby steps in the right direction.

In other words, research shows people get more benefit from their mindfulness practice when they meditate 10 minutes a day, every day, than if they meditate for an hour, once on the weekend. People get more benefit from their gratitude practice if they journal 3-5 things they are grateful for every day than if they make a list of 20 things on the weekend.

A moment of mindfulness - noticing the experience of the moment and your reactions to the experience of the moment, a moment of self-compassion - care and kindness toward yourself for the experience of that moment, the experience of your reactions. Neuroscientists have found that mindfulness and compassion practices are two of the most powerful agents of brain change known to science. And they happen moment by moment, little and often.

Q&A

S-34 Mechanisms of Brain Change

We can look briefly here at four mechanism of brain change - conditioning, new conditioning, re-conditioning, de-conditioning, that *will* shape the brain toward the wise and the wholesome. People love to learn how their brains work. It gives them a sense of empowerment and mastery and efficacy

that is very helpful to them in recovering resilience and resolving their traumas and moving into post-traumatic growth.

S-35 Conditioning

First, oversimplified: **conditioning** which is what the brain does all the time on its own when we're not directing it to do something else. When we're not guiding the installing of new patterns of coping in the brain, or rewiring old patterns, the brain does its own learning and automatically encodes responses to experience in its neural circuitry.

Any experience, any experience at all, positive or negative, will cause neurons in the brain to fire. When we repeat the experience, we repeat the neural firing. When we repeat the experience enough, and the pattern of neural firing is repeated enough, "neurons that fire together wire together," the neurons strengthen the synaptic connections between them, meaning the brain is now likely to fire in exactly the same way when the same or similar experience is repeated. These synaptic connections stabilize into new neural pathways, generating new, stable habits of response.

S-36 photo of grooves in hillside

A metaphor that is often given for conditioning is that of rain falling down a hillside. When rain first starts falling down the

hillside, it can run down the hillside any way that it wants. But eventually the falling rain starts to develop little grooves and ruts, then bigger gullies. Eventually the rain can only fall down the hillside in those grooves and gullies. That's a metaphor for how our brain develops pathways and habitual patterns of response so that, without intervention, we automatically respond to a stressor in ways that we have responded before.

Conditioning is what shapes our earliest attachment styles and early automatic patterns of coping, long before there is any conscious choice in the matter. So very often we see these old habitual patterns coming up out of implicit memory and derailing the client's capacities to cope flexibly and adaptively now.

When we want to rewire old patterns of coping, ever rewire trauma responses themselves, we can use three mechanisms of brain change to create new experiences, new wiring.

Again, over simplified:

S-37 New Conditioning

New Conditioning is simply deliberately intentionally choosing to cultivate a new experience, a new practice, to shift the functioning of the brain, and the habits of the brain, in a new direction. Any time we help clients cultivate a gratitude

practice, or deepen their listening skills, or strengthen the focus of their attention, or cultivate more self-compassion or self-acceptance, we are using the repetition of those experiences to create new learning, new circuitry, new habits of responding to life events, even potentially or previously traumatize events. We are helping them create new wiring in the brain, new memories, new ways of being.

New conditioning does not rewire the old conditioning. When we're stressed out or tired, our brain will default to the old pattern; it's easier, more efficient for the brain to do what it already knows how to do. But with enough repetition, we create a choice point in the brain, and with reconditioning, we actually can rewire the old circuits.

S-38 Reconditioning

Reconditioning: The technical name for reconditioning is memory deconsolidation-reconsolidation. Neuroscientists have only been able to see this mechanism operate in the brain through their scanners in the last five to seven years, but it has been the basis of all trauma therapy for decades.

The best reference about reconditioning is Bruce Ecker's book *Unlocking the Emotional Brain: Eliminating Symptoms at their Roots Using Memory Reconsolidation*.

If we can “light up” the neural networks constellating a negative memory - meaning we can evoke a visual image of an event, the emotions associated with that event, locating those emotions in our body, and bring to mind negative beliefs about the self triggered by that event - and then deliberately evoke a positive memory or experience or even new positive memory that will strongly contradict or disconfirm the original negative memory, and hold those two memories, negative and positive in awareness at the same time, or toggle back and forth between the two, the juxtaposition itself will cause the neurons to fall apart and instantly rewire a fraction of a second later. When the positive is strong enough, it will trump the old memory and rewire it.

This mechanism doesn't change what originally happened, but it does change our relationship to what happened. It doesn't re-write history, but it does rewire the brain.

S-39 Modes of Processing

Now, both new conditioning and reconditioning use a focused mode of processing in the brain. We are deliberately guiding the focus of the attention of the brain to a particular task, a particular exercise.

When neuroscientists first began scanning the brains of research subjects in their fMRI's, they assumed that when they weren't

asking the brain to do something, name a color or solve a puzzle, that the brain would be quiet.

No.

They learned that the brain “at rest” was more active than ever and all over the brain. This has come to be known as the default network of the brain, what the brain defaults to on its own when we’re not consciously focusing attention on a task, and we use it for what I call deconditioning.

S-40 De-Conditioning

The de-focused attention of the default network, when we’re not guiding the attention of the brain’s processing, allows the brain to “play” on its own, creating its own associations and links. We can use that mode of processing in the brain to create random change, and use the insights from that meandering and playing of the brain to create new behaviors.

We can experience the default network anytime we’re experiencing a sense of reverie or in our daydreams, the brain just meandering where it wants to. We can use the default network in deconditioning exercises using our imagination, in guided visualizations and guided meditations, to open the brain into what Dan Siegel at UCLA calls “the plane of open possibilities.” It’s true that the default network sometimes has

a bad rap, from meditators who notice the brain's wandering into a thousand thoughts when we're trying to concentrate on the breath or on a mantra. That's what the brain does. And we can drop into worry and rumination in the default network if ongoing concerns about our social self drops us into thoughts - do they like me? Do I belong? Did I just do something stupid in front of other people? What do they think?

Any time clients fall into that worry mode of the default network, and clients can go there easily if they are carrying a sense of shame about any potentially or previously traumatizing event, we can help them shift their focus again to being in the present moment, being in the room with us, noticing the sensations in their body or the rhythm of their breathing. Coming into focused attention in the present moment to pull out of the defocused mode of worry and rumination, shaming and blaming. But we can also use the positive aspect of the default network, the imagination and free association, to create new insights, new behaviors, from our own deep intuitive wisdom.

There's an intuitive wisdom in teaching the mechanisms of brain change in the above order.

Four Mechanisms of Brain Change

Conditioning - awareness of implicit patterns of coping so don't get hijacked. When aware....

New Conditioning - cultivating practices to create new habits/circuitry. When functioning of higher brain is stably online....

Re-conditioning - deliberately rewiring old patterns from memory deconsolidation-reconsolidation. When able to focus and safe to de-focus....

De-conditioning - relaxing the brain into its own default network, trusting the arising of deep intuitive wisdom.

At a meta-level, we begin to develop a sense of ourselves as someone who *can* use these mechanisms to effectively create brain change. We see ourselves as someone who *can* learn tools to cope with difficulty, disappointment, even disaster. We can become more resilient; we can move into thriving and flourishing.

S-41 Four Intelligences

As we proceed through this training we will be applying these four mechanisms of brain change to four intelligences:

Somatic Intelligence - healing trauma from the bottom up using body-based tools to return the body-brain to a baseline

physiological equilibrium, to settle the nervous system and prime the neuroplasticity of the brain.

Emotional intelligence - working with the upside of the client's dark side to use emotional expression to shift the functioning of the brain, to perceive, regulate, manage the information coming from their own emotions and to attune to, empathize, and understand the information coming from other people's emotions.

Relational intelligence - using regulation and resonance in the relational field, strengthening the capacities of our brains to cultivate connections with other people, social or intimate, as resources for our own resilience and well-being to help clients move through trauma into growth.

Reflective intelligence - using mindful awareness to perceive patterns clearly, strengthening the capacities of our brains to monitor and modify our own perceptions of life events and our reactions to those perceptions of those events, so we can discern options and choose wisely, and make sense of and integrate any trauma stories in the larger life narrative.

Q&A

S-42 **Emerging Philosophy of Brain Care**

In this section we learn how to take care of the physical brain that allows us to use all the tools of neuroplasticity we will be learning about throughout this entire workshop. A key shift in perspective about brain care is consistent with the little and often philosophy:

Shift from Macro Care to Micro Care

Shifting from - or at least balancing - macro care - big picture solutions - change jobs, take a vacation, work out at the gym - to micro - in the moment solutions - take a nap, stretch your body, take a self-compassion break.

The macro experiences will certainly work – a splendid vacation, a peaceful hike in nature, a resonant conversation with a good friend – will help rejuvenate us and restore our enthusiasm and confidence about ourselves and our work.

Those big practices, big tools, may take time and money; external resourcing to resource internally.

Micro tools are available more easily, more of the time, and the shift to a micro focus is excellent because micro practices can work more effectively to bring the brain out of any kind of fatigue because they operate precisely how the brain operates –

little experiences, in the moment, repeated again and again and again to install in the brain as a resource over time, eventually even becoming a new way of being.

The brain really does learn and rewire best in little micro experiences, processing experiences moment by moment, “little and often.” In other words, it can be better to pause and notice and register a positive pleasant moment, 30 seconds, 6 times a day, than to spend 30 minutes reviewing positive experiences of the week. Both are fine, but the brain changes steadily in repeated increments, and creating these micro tools and micro habits, “little and often” are the best gift of self care we could give ourselves.

I first learned about this shift from macro to micro first from Ashley Bush Davis and her book Simple Self Care for Therapists. You may have experienced benefits of both.

S-43 How to Replenish Human Brain

Exercise-Movement

Sleep-Rest

Nutrition

Learning something new

Laughter-play

Hang out with healthy brains

Exercise, sleep, nutrition, top three for health of physical brain. The rest are essential for health functioning and continued growth of the brain.

In this session, we'll focus on lifestyle choices we can make that will help us take care of the physical brain and help us harness the neuroplasticity of the brain.

S-44 Exercise-Movement

Macro

A lot of research lately on the importance of vigorous physical exercise for the brain, and for good reason.

Whatever is good for the heart is good for the brain. Exercise is required to maintain health of brain;

Blood carries oxygen and glucose; are fuel

Signals dopamine, serotonin, endorphins - feel good

Exercise as powerful an anti-depressant as Prozac

Exercise is anti-inflammatory (underlying most diseases)

BDNF - brain's growth hormone: new neurons, stronger connections, myelinate faster;

BDNF in hippocampus, memory center, can reverse memory decline in elderly; reverse physical shrinkage of brain; improve memory and integration of functioning overall

(stress hormone cortisol binds to BDNF, why kills brain cells, runaway stress drives depression, disrupts serotonin, dopamine, social interaction)

protects telomeres on ends of chromosomes (like plastic tabs on ends of shoelaces to keep from unraveling); prevents copying errors; protects against all disease

Turns on genes linked to longevity; 2400 twins active and sedentary, active brains are 10 years younger

Any movement (30 min/5 times/week; 20 min/3 times/week.)

Micro -

Christine Carter's better than nothing workout (3 minutes)

Anat Baniel - sitting is the new smoking

Kaiser poster - woman carrying groceries, Life is a gym.

Study of hotel maid; told work was exercise; showed physical benefits of exercise

move once every hour – wake up brain out of fatigue

sense and savor walk

yoga, chi gong – move energy

Feldenkrais, neuro-movement, slow, subtle movement,
wake up, re-wire - re-map brain

S-45 Sleep-Rest

Sleep not just absence of consciousness. Sleep is a different consciousness. (Secret Life of Sleep, Kat Duff). Essential (evolution)

Every function in body is affected by sleep, Affects genes, inflammation, immunity, metabolism, circadian rhythm especially brain. How we cope with stress, how quickly we process information, how organize and store memories

Macro

8 hours - housekeeping, reset nervous system, consolidate learning

Sleep deprivation is catastrophic; 5-6 hours for 1 weeks, same level of cognitive impairment as if legally drunk.

Without sleep, less PFC, less impulse control, doubles recovery from depression

We don't need to become better people; we just need to become better rested - Kelly McGonigal

Two kinds of sleep:

REM-activates SNS-dreams

Slow wave, deep sleep - activates PNS, no dreams, deep peace of enlightenment

Deep non-REM sleep is what is restorative. Children - lots. Adults - 20% of sleep. Over 50 years of age, sometimes 0%

How to get there: sleep hygiene

Reduce stress; reduce stressing; news fast, media diet

Cuddle, resource with OT

Go to bed, get up at same time, even on weekends

Dark, cool, quiet room, only sleep and making love

No caffeine, alcohol after 6pm

Shut down TV/devices one hour before sleep

Yoga nidra - Richard Miller

Micro

Nap - 20 minutes, 2pm-4pm

mini-meditate: stop for 10 breaths, soak in peacefulness of slow, gentle breathing, sense of being present, alive, preciousness of this moment.

take a recess, a mental break,

S-46 Take Mental Breaks

Switch the channel – 3 minutes

focus on thinking about something else – -
Skillful Distraction, positive is good

talk to someone else – relational regulation;
resonant is good

move-walk somewhere else – nature is good

nature stats This is your brain on nature.

S-47 Nutrition

Healthy Mind Cookbook; MIND (Mediterranean-Intervention for Neurodegenerative Disorders) slow the build-up of toxic materials that cripple memory and critical thinking. Vegetables, leafy greens, nuts, berries, beans, whole grains, fish, poultry, olive oil, one glass of red wine/day. Omega-3's in fish single nutrient most associated with brain health

Controversy and contradictions - Michael Pollan - eat real food, mostly plants, not very much;

macro – eat – fuel to body and brain

eat healthy! More protein (neurotransmitters), more water, (flushes toxins, keeps cells alive) less sugar, less carbs (Perlmutter Grain Brain neurotoxins), less calories, less caffeine/ alcohol (timing and volume); ironic, brain is 60% fat, do need fat. Do need Omega-3 supplements, not enough in diet anymore. Microbiome 100 trillion microbes in human body; extract nutrients, protect immune system, enhance brain function (processed food, antibiotics)

so sorry! Harm reduction; high sugar diets can prompt runaway inflammation and ultimately impair brain function; obesity directly impacts cognitive functioning and longevity; SAM Alzheimers = Diabetes III. Sharpagain.org

micro – savor what you are eating, eat a raisin meditation, eat one meal a day without doing something else at the same time (may be macro)

S-48 Learn Something New - Curiosity

Macro: (requires **integration** of different brain functions)

learn to play a musical instrument (one neural cluster in auditory cortex dedicated to processing music)

learn to speak a foreign language

these two reduce risk of Alzheimer's by 50%

MUSIC:

heightens positive emotions through dopamine
 reduces stress - heart rate and cortisol levels (singing
 to antidote road rage)

can be more powerful than medication in recovering
 from surgery, reduces pain, increases immunity

Alive Inside documentary

According to studies done by Tracy Shors, a neuroscientist at
 Rutgers University, “Learning rescues these new cells from
 death.”

“A colossal number of brain cells, hundreds to thousands, are
 born each day but most die within weeks unless the brain is
 forced to learn something new. Then more neurons revive and
 sprout connections to their brethren. The harder the task, th
 more survivors.

learn to play juggle or play chess

try a new recipe

drive a new way to work

visit a new city on the weekend

Micro: Curiosity

learn a new poem, new quote, flower, bird each day

not just facts but enthusiasm about facts
 improves memory; increases longevity, 5 years

S-49 Laughter-Play

Physiological mechanism; reduce stress, increase
 catecholamines, (dopamine and norepinephrine) mind brighter

Play stretches imagination, comfort with unknown, uncertainty,
 creativity rejuvenates brain; longevity and memory

macro – have a good time at a family gathering or dinner with
 friends or a birthday party

dinner conversation; tell family stories/lore: best predictor
 of academic success; more than time in school, time doing
 homework, time in sports, time in church, across SES

schedule a play date – creative, cultural event with
 friends – or a silly date – swimming with your grandchildren

join a laughing yoga class; acting; improv

micro – watch a 4-minute video on Happify Daily

Greater Good Science Center

S-50 Create With Your Hands

- Knitting, woodworking, quilting

- Deep brain stimulation; meta-sensory cortex
- Flow state reduces stress
- Focus reduces worry, rumination
- Creativity evokes parallel psychological well-being

S-51 Hang out with healthy brains

Social interaction essential. For many reasons, today 1/2 American have zero close friends. People who experience rejection and neglect over 5 years time more likely to have cognitive impairment

Macro: participate in a conference, a support group, book club, a choir, a cycling group

[Dan Siegel: could stay home and read the book]

Do a gratitude practice at family dinners

Micro:

Send text or email of gratitude, acknowledgement, appreciation to friend or co-worker; good business management now; don't wait until end of year review; send appreciation every day; make it 80% of someone's review.

S-52 Brain Care is Self Care

- Choose one practice of brain care
- Practice every day for 30 days
- Reflect on difference in functioning, in resilience and well-being, in sense of self

1pm