



PTSD 101 Course

Transcript for: Resilience to Stress and Trauma

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Well thank you for joining this presentation. My name is Dr. Steven Southwick. I work at Yale University and the National Center of Post Traumatic Stress Disorder (NCPTSD) and I will be talking about resilience to stress and trauma.

Today, we have a number of learning objectives. The first is to describe resilience. Second, to discuss the mediators and moderators of trauma and resilience and to review that scientific literature. And, third, is to describe potential clinical applications.

Objective one is to describe resilience.

Now, there is no single definition for resilience. Resilience is actually a rather complex construct. A number of definitions have been used in clinical and in research settings. One definition is: symptom free functioning following trauma so that after a trauma, the individual does not seem to express increased or new psychological symptoms. Another definition: positive adaptation despite adversity, and there is even a neurobiological definition: enhanced psychobiological regulation of stress and fear.

Now, two common definitions are the American Psychological Association's definition of resilience: the process of adapting well in the face of adversity, trauma, tragedy, threats or even significant sources of stress. And George Vaillant, a researcher at Harvard – resilient individuals are those who resemble a fresh, green, living, twig when twisted out of shape such a twig bends but does not break; instead it springs back and continues to grow.

Now, resilience is multi-dimensional and it's dynamic in nature. So, any of us can be competent during stress and adversity in one domain but not necessarily in others. For example, I might be very resilient during stress from an academic standpoint but maybe not so much from a social standpoint. Or, I might be emotionally resilient but not so much physically or interpersonally. So, when we think of resilience, we really need to assess resilience in terms of different domains in an individual's life. Also, an individual may be resilient in a particular domain at one stage of their life but not so resilient at another stage.

Now the measurement of a construct such as resilience is complex. There are a number of groups of researchers who have developed ways to measure resilience. Again, there is no one tried and true definition so measuring resilience is a challenge. I have here on this slide a number of scales that have been developed to measure constructs related to resilience.

The Dispositional Resilience Scale-15, and this measures hardiness. Hardiness has a number of subscales: commitment, perceived control and challenge—how committed I am, how much control I believe I have and the degree to which I embrace challenge. The Connor-Davidson measures resilience characteristics including hardiness, personal confidence, tolerance of negative affect, acceptance of change, personal controls and spirituality.

More recently the Response to Stressful Experiences Scale assesses a broad range of behaviors, thoughts and actions that individuals characteristically employ in responding to stress, adversity and trauma. So in other words, during high stress situations, how does the individual think, how do they regulate their emotions, how do they behave? And there is also a resilience scale for children and adolescence.

The individual—all of us—obviously live in an environment. Our psychological and neurobiological responses to stress and trauma take place in the context of other human beings, available resources, specific cultures and religions, organizations, communities and societies, each of which may be more or less resilient in their own right and more or less supportive of the individual's resilience.

For example, during a disaster, the individual's resilience is dependent on their own coping mechanisms, that is their cognitive, emotional and behavioral coping mechanisms; the coping mechanisms of other individuals and of their families; available resources; the community's ability to adapt to adversity through preparation and effective response and the cultural beliefs and practices.

A common question that I get asked is: "Is it possible for the average person to become more resilient?" Absolutely. In fact, much of this talk is about factors related to resilience and these factors can be enhanced through training.

Moving on to objective number two, discuss the mediators and moderators of trauma and resilience, and to review the scientific literature.

There are a number of mediating and moderating factors with regard to resilience. So, resilience is affected by genetics, development, neurobiological factors, psychosocial, spiritual and, undoubtedly, others.

For example, in this well known and elegant genetic study by Casby and colleagues, a functional polymorphism in the promoter region of the serotonin transporter gene has been shown to moderate the influence of stressful life events on depression. If you look at the left vertical axis, you will see probability of major depressive episode. If you look at the horizontal axis you will see no maltreatment, probable maltreatment and severe maltreatment. If you look on the far right, you will see SS, SL, LL. If there is no maltreatment, then it doesn't matter whether you have two short alleles, SS, or two long alleles of the serotonin transporter gene, with regard to the probability of developing major depression.

However, if you are exposed to severe maltreatment, if you have two shorter alleles, SS, you are significantly more likely to develop a major depressive episode in the face of severe maltreatment than if you have the LL, two long alleles. This is a very good example of a gene environment interaction. And by the way, there's continued research that would suggest that even with a genetic vulnerability like the SS gene, having high social support at the time of the stress and trauma can help to buffer against the expression of a major depressive episode.

Developmental factors also play a role. There is a large body of research, animal research, and, more recently, human research, showing that individuals who are exposed early on to severe stress that they cannot manage, may have greater levels of anxiety and exaggerated stress hormone responses to future

stress than those who are not exposed to such early severe stress. On the other hand, exposure to early mild to moderate stress, stress that you can actually manage, may lead to reduced anxiety and stress hormone responses to future stressors.

For example, there is a large body of animal literature showing that infant monkeys, for example, if they are exposed early on in life to stress that is beyond their skill level, and for this, for young monkeys, one of the most profound stressors is being separated from their mother for an indeterminate period of time that they cannot predict when the mother is coming back. This may lead to a nervous system that hyper-responds in the future. And, on the other hand, graduated or manageable stressors early on can actually lead to a hardier animal later in life.

There are numerous neurobiological factors associated with resilience and this is a relatively new but emerging area. What are some of those neurobiologic factors? Neural circuits related to fear, fear conditioning and extinction, emotional memory consolidation and reconsolidation, regulation of motivation and reward, adaptive social behaviors. Also, regulation of the sympathetic nervous system and the hypothalamic pituitary adrenal axis. These are critical for our fight and flight response. Other neurotransmitters and stress hormones, serotonin, testosterone and others are associated with resilience. And, there appears to be an additive effect of multiple neurobiological resilience factors.

An example of a neurobiologic factor is neuropeptide-Y which is a 36-amino acid peptide neurotransmitter that is released with norepinephrine, also called noradrenaline, when the sympathetic nervous system is strongly activated. So, when we are afraid and have a big fight/flight response, we release norepinephrine to help us engage in that fight/flight response, but we also release neuropeptide-Y, which helps to turn down the response so that the noradrenergic nervous system does not overshoot. It helps us come back to baseline, and neuropeptide-Y levels have been associated with decreased anxiety, decreased dissociation and better military performance. Basically it is coming back to baseline more rapidly.

Another example is DHEA (dehydroepiandrosterone), which modulates the effects of cortisol. Cortisol, like epinephrine and norepinephrine is critical for the stress response. And DHEA may play a protective role by decreasing cortisol or containing cortisol. And, we found that soldiers with greater release of DHEA before and during stress have better, superior military performance and fewer symptoms of dissociation.

I'd like to talk about potential psychosocial factors supported by research literature, these factors being associated with resilience. Undoubtedly, there are more factors but these are some of the most common. Having resilient role models, positive emotions, emotion regulation, cognitive flexibility, coping style, spirituality, moral code, social support, training (physical, cognitive and spiritual), rapid recovery, purpose and meaning. And I will go through each of these briefly. It is important to understand that each of these psychosocial factors can be enhanced through learning and training.

Role models tend to be very important with regard to resilience because a role model can transmit attitudes, values, skills, patterns of thought and behavior, and learning through imitation can be very powerful. Imitation tends to work best with simple tasks. With complex tasks, it's best to sub-divide the tasks into rational segments and then focus on one segment at a time. It's then possible to transform that information into rules.

For example, if I have several colleagues who I consider to be highly resilient, and I study their behavior, the way they think, the way they regulate emotions, and I notice that under conditions of high stress, they tend to reach out for and attract social support – friends, colleagues and so forth - who can really help them. I notice they all do this. I can now transform this segment into a rule for myself. When I am in a difficult situation, reach out and attract social support.

Positive emotions are strongly associated with resilience, but it is realistic optimism not rose-colored optimism. Optimism is a basic belief that the future would be bright and like pessimists, a realistic optimist pays close attention to relevant information. But unlike pessimists, they do not dwell on the negative information and they disengage rapidly from problems that appear to be unsolvable. So, it's not rose-colored optimism, it's realistic optimism.

There is a very large literature on the association between positive emotions and health. Just a few highlights: fewer psychiatric symptoms after exposure to stressful events in individuals rated as having high positive emotions, better self reported physical health, reduced cardiovascular responses when exposed to high stress.

Can positive emotions be increased or enhanced? Yes, they can. First, pick optimistic parents. Well, we all know we can't do that. In fact, optimism is in part related to genetics, but by no means is it all genetics. There is an important developmental and learning component. Researchers have found that inserting positive thoughts actually does help with optimism. And perhaps even more important is learning to refute the negative. This is what many of the cognitive behavioral therapies focus on.

For example, optimists and pessimists tend to have what's called different explanatory style. So the pessimists may flunk a test in differential equations, which, by the way, I did, and get the exam back and say, "Oh my gosh! I flunked this test. I am terrible in math. I am terrible in all subjects. I'm never going to complete college. I'm going to be a complete failure in my life." They have catastrophized and they have generalized. This is a habit, a habitual way of responding.

The optimist may flunk the same test in differential equations and say, "Oh boy, I flunked this test. Not good, but you know I am pretty good in other areas in math, and I'm fine in my other subjects. I'll be okay. Next time I just need to study harder." So the optimist has not catastrophized and has not generalized. These tend to be habitual ways of thinking about issues that are amenable to training. There is even a therapy called learned optimism where the individual learns to recognize that their catastrophizing and generalizing and question the validity of that.

Now, resilience is very much dependent on ability to regulate emotions and one very important is learning to control fear. If you have difficulty facing fear, if you cannot face your fears, it is going to be very difficult to be resilient.

How to face your fears? Well, one is to decrease novelty because the nervous system responds robustly to novelty. The more familiar you are with a situation, the better with regard to fear. Can you increase predictability? Can you increase your sense of control? Can you enhance what's called procedural memory? Practice, practice, practice the skills needed to get through the fear. The more realistic the training, the better.

So for example, firefighters and soldiers try to train in highly realistic scenarios so they've been there. They have seen it. They know they can manage it. And stress inoculation refers to gradually increasing the challenges that you face once you have mastered a particular level of training. It is important to realize that when I face a fear, how I appraise that fear is critical with regard to my nervous system and my psychological state of being.

As an example, two people are facing a fire. One is a firefighter, one is someone who has never been in, or fought, a fire. The firefighter may look at that stressor and say, "I've seen this before. I have the skills to manage this fire, and in fact, this is a great opportunity for me to help." That individual's neurobiological, psychological responses to stress will be far different than the individual who has never

seen a fire before, doesn't think they have the skills to manage this, so their appraisal of the situation will very much determine how resilient they actually are.

In talking with some special forces instructors and asking them how do they help their trainees face fear, this is what they said. First, acquire information about what is feared – learn about it. Then learn the skills necessary to move through the fear. Have a plan and a backup plan. Practice the plan and the backup plan and then confront fear with trusted colleagues when possible.

If you think about it, many of the successful treatments for PTSD involve facing fear; the exposure therapies – there is prolonged exposure, cognitive processing therapy, EMDR (eye-movement desensitization and reprocessing) and mindfulness. In each of these therapies there is a component, a very big component, of facing what it is you fear. In fact avoidance is at the heart of all anxiety disorders. It is very understandable that we would want to avoid situations and reminders that make us anxious or afraid. But in fact, that avoidance is a big part of all of the anxiety disorders.

Cognitive flexibility really involves a number of different skills, if you will. One is reappraisal, the ability to cognitively appraise, reframe or find positive meaning in adversity. For example, redefining a crisis as a challenge and an opportunity.

One version of cognitive flexibility is humor and Viktor Frankl, a Holocaust survivor who developed Logo therapy, had this to say about humor, "Another of the soul's weapons in the fight for self preservation is well known that humor more than anything else in the human makeup can afford an aloofness and ability to rise above any situation even if for a few seconds."

And, humor tends to create distance from pain and fear. There tends to be a creative exploration where humor broadens my focus of attention and flexibility of thinking. I may even cognitively reappraise the situation that I have faced. I am taking a look at something painful. I am looking at it from a different viewpoint and I am actually laughing at it to some degree, gaining some mastery over the situation. I am also employing a version of exposure. Now it is possible that humor could have counter-productive effects if it's used in the service of avoidance.

Resilient individuals tend to use active coping styles. What does active mean in this case? Gathering information, acquiring skills, confronting when necessary, problem solving, making decisions, seeking social support and cognitively reappraising.

On the other hand, passive coping styles include denial of the problem altogether, waiting for the dust to settle. Now, it's not always problematic to wait for the dust to settle, but in general, passive coping styles are not as effective during situations of high stress. Divert or distract attention, yes, sometimes this can be helpful, but often not so. Avoid or withdrawal, substance use, repetitive negative venting, repetitive blaming someone or something else. Sound familiar? I know it does for me.

There have been a number of studies looking at active versus passive coping and in some of these they found fewer PTSD symptoms in Gulf War Veterans and survivors of the World Trade Center attacks. Those who had active coping, lower levels of distress and ER (emergency room) physicians and less depression in individuals with a variety of medical illnesses.

Religion and spirituality have also been associated with resilience and in a number of other psychological and medical conditions. For example, religion and spirituality have been associated with longevity and with fewer hospital days in a number of medical conditions, lower levels of depression in both medical and non-medical populations and lower distress at the time of the trauma when religious coping is employed.

It is important to mention that not all studies have shown a positive association between religion, spirituality and resilience or wellbeing. But many people find great strength in their religious spiritual beliefs and these strengths enhance meaning, they tend to promote in some ways social support with others who believe as strongly and seem to be strongly related to be able to cope with difficult situations.

What about moral code altruism? These have been associated with resilience and positive mental health. An example is required helpfulness during WWII. Researchers noticed that some individuals with mental health diagnoses benefitted by helping others during the London bombings. They had a reduction in their psychological symptoms.

In ethology, the study of animal behavior, there is a term called reciprocal altruism where some animals that share their resources during times of plenty tend to receive more resources from other animals during times of deprivation. And in brain scan studies, mutual cooperation, that is, where two subjects have to cooperate with one another activates brains regions involved in the processing of rewards; the dopamine nucleus accumbens reward system. So, in other words, in the brain these studies that require mutual cooperation appear to be rewarding.

In talking about moral compass and integrity, Admiral James Stockdale, the senior commanding officer of the Vietnam Prisoners of War at the Hanoi Hilton, had this to say, “You can’t buy it or sell it. When supported with education, a person’s integrity can give him something to rely on when his perspective seems to blur, when rules and principles seem to waver, and when he’s faced with hard choices of right and wrong. It’s something to keep him on the right track, something to keep him afloat when he’s drowning.”

Having a clear sense of what you know to be right or wrong enhances decision making during times of stress. One can then proceed relatively unencumbered by doubts about ethical and moral behavior.

Without question, one of the most important resilience factors is social support. And those who have high social support, in a number of studies, have been shown to be, to some degree, protected against mental illness, more effective in their coping strategies, they have less debilitating appraisals of threat and reduced physiologic reactivity to stress.

On the other hand, poor social support has been associated with greater clinical depression in a host of medical patients, exaggerated cardiovascular and stress hormone responses to stress and higher rates of PTSD in combat Veterans. This has been shown a number of times; that high social support, people you can really count on, make a significant difference in whether or not you develop PTSD or other trauma related symptoms.

Having poor or limited social support can be problematic during times of high stress. Any of us who have been through stressful situations with trusted colleagues know this. And certainly in our interviews with Special Forces Soldiers, the importance of your buddy, of the others in your unit, cannot be underestimated.

Now, we are going to move on to objective number three, describe clinical applications.

All of these psychosocial resilience factors that we’ve been talking about can be enhanced by training; learning and training. And, one reason is because the brain is malleable. It tends to be resilient and responsive. And learning and remembering actually involves plasticity in the brain and the formation of new synapses. So when I learn, and when I practice, I am actually changing my brain.

Experience rewires the brain—the more a skill is rehearsed the more space and wiring the brain devotes to supporting the new skill. Now, it is important, when I am training, to train correctly. If I would like to

improve my baseball swing, and I go out and I practice incorrectly over and over again, I really am not helping myself at all. In fact, I may be hurting my chances of being a good batter. So, when I practice, I need feedback, I need training, and I need to educate myself or have a coach. And I need to practice correctly if I want to experience success.

We talked earlier about manageable and unmanageable stress. Manageable stress increases your capacity to effectively manage future stressors and resilient people get pretty good at assessing upper and lower limits of stress exposure. What can they actually tolerate? Because we know that too little stress and you get no growth and you can actually get weakening. It is like not using a muscle. If you are laying in bed and don't use a muscle it will atrophy. On the other hand, training that is too much—if I want to run a marathon and my first day of practice I go out and I run twenty-some miles, I'm going to get physical breakdown and it's going to be harmful to my chances.

On the other hand, optimal stress is stress that's above my comfort zone but not unmanageable. And, this is very important with regard to becoming more resilient. When I train, I want to train in general somewhere out of my comfort zone but not in a zone that is unmanageable. You know great coaches, great parents, great teachers, great mentors understand this and they get to know their mentees very well because to be a great coach or parent, you really need to understand the limits of what your mentee can and cannot tolerate. And if you want to help them grow, you will help them to challenge themselves but not overwhelm themselves.

I often get asked if stress is always a bad thing. And in many ways, stress has gotten a bad reputation, but in fact, as I've just described, stress is critical for growth—essential—but it needs to be manageable.

Training, of course, can occur in numerous domains. Training may occur in physical endeavors, emotional training, cognitive training, spiritual training, and it can be delivered in various arenas: the classroom, therapy, scenario based, etc.

Training can include physical exercise as well, because it has been shown the physical exercise obviously improves physical health, in some cases can decrease depression, reduce anxiety, improve memory, increase self esteem, and this is partly related to enhanced plasticity and neurogenesis. Recent research has shown that exercise can actually increase what are called neurotrophic factors in the brain. Most of this research has been done on animals, but it is very well done research, that exercise can increase neurotrophic factors which can help to repair neurons in a number of areas in the brain that have probably been damaged by stress.

Resilience also involves cognition and attitude; the belief that every stress is a potential opportunity for growth. This is a hard one in reality to practice but there are people who believe this, Viktor Frankl among others. A mind set to meet challenges and overcome obstacles that block success. The resilient individual tends to accept that achievement rarely comes without enormous work and hardship and understands the importance of discipline and regulating emotions and values perseverance and courage.

One of the things that people sometimes forget with regard to training is the importance of recovery, and if you want to be resilient you have to learn how to recover. And some people feel that the level of recovery needs to match the level of stress. Before we take on a new stressor it's important to recover from the last, if we can; if we have the time. And recovery should be systematic and disciplined. It's like lifting weights—you don't do upper body weights two days in a row. But it is the same with any form of training where you are stressing yourself. The importance of learning how to recover is absolutely critical.

Failure to recover can actually cause damage to your own nervous system. Sometimes your own stress response can be more damaging than the stressor itself and that typically happens when stress

continues unabated for long periods of time. So, it's critical to learn how to modulate and recover from highly stressful situations.

Having meaning or purpose and a mission can very much enhance resilience. "Men are strong for as long as they stand for an ideal" – Freud "He who has a why can endure almost any how." – Nietzsche. "Man's heart is restless until he has found and fulfilled meaning and purpose in his life." – Frankl

And any really good leader understands that his soldiers or his employees need to understand the mission of the organization and believe in the mission of the organization if that organization is going to be strong and resilient.

People often ask me if there are any shortcuts to resilience. Unfortunately no, or at least probably not. For the most part it takes real dedication and persistence. There are, of course, times when people have life-altering experiences that transform them in some way and often those can be resilience-enhancing. But for most of us, it requires consistency, dedication, perseverance, and training.

Now, in some cases, people who have been traumatized report what's been called posttraumatic growth or at least some degree of posttraumatic growth. For example, in interviewing a large number of Prisoners of War from Vietnam, some reported that the experience—not that they would want to repeat it—but that as a result of that experience they had a greater appreciation of life, they felt as if they had more wisdom and maturity, there might have been a shift in values and philosophy, maybe new meaning, a new purpose perhaps, often greater compassion, in some cases closer ties with family and friends, a development of various coping skills and, even in some cases, improved self esteem for having weathered such horrendous conditions.

Interventions to enhance resilience.

This is actually a relatively new area in research although many organizations have what are believed to be effective methods of enhancing resilience – the military, police training, fire training etc. These interventions, which are now being studied, can be delivered before the stress and trauma or afterward. The training tends to be educational in nature involving psychological education, cognitive behavioral strategies to address how you are thinking about your involvement in the trauma, and then realistic scenario based approaches, which we've discussed, where the training involves settings and situations that are as close as possible to what the individual actually experienced in the dangerous situation.

Training can be delivered in a variety of formats—in a classroom, internet, therapy based—and interventions can be targeted toward the individual, family, organizations or community

When resilience enhancing intervention are delivered pre-stress, their goals are often to increase the individual's perception or perceptions of predictability and controllability. "I am accustomed to these feelings I have inside of fear, of increased sympathetic nervous system tone. I've recognized these, I've had these before. I can make it through. I can control this, at least to some degree." They're also geared toward developing stressor specific skills, like intensive combat training. I need to learn the specific skills to negotiate the stressors that I am most likely to encounter. Obviously, the training that a fireman gets is different from a specific training that a policeman gets or that a combat Soldier gets. And then, there's developing generic stress management skills, such as diaphragmatic breathing, muscle-relaxation training, which really can be applied to any kind of stressor, not just to one specific stressor. As we have said a number of times, the more intensive realistic scenario-based training the better. And in general, it's most effective when delivered in graduated doses of intensity. So, you don't overwhelm the trainee from day one, but there is a gradual process of inoculation.

Now, there are a number of interventions that have been developed to enhance resilience or resilience related factors or constructs in the individual. We don't have time to go into these specifically, but some of the examples that are now being tested are hardiness training, stress-inoculation training, psychoeducational resilience enhancement. There are interventions to enhance social support, learning how to build a social network, learned optimism training - learning, in other words, to explain situations in a way that one does not generalize and catastrophize - and well-being therapy.

Another question: "Is there a role for resilience or resilience training in therapy for trauma victims or trauma survivors?"

Yes. I believe there is. Of course, the backbone of therapy for trauma survivors involves a variety of psychotherapies and, in some cases, pharmacotherapies that are evidence based, such as the cognitive behavior therapies, exposure therapies, and a number of medications. However, there is often a role for building strengths; for helping the individual to augment strengths they may already have or that they want to develop; strengths that we've been talking about that enhance resilience.

Now, resilience interventions after a trauma, in many ways, these overlap with therapies that we already know about; therapies for stress reactions or for PTSD. And these include Psychological First Aid, which is often delivered not necessarily to people with PTSD; brief cognitive behavior therapy; and augmentation of resources - since resources are very much involved in one's reaction to stress - and building social networks.

And of course, there is a great deal of research that needs to be conducted since we're really only just beginning to understand resilience. We need to further define and operationalize resilience. We need to understand neurobiological factors associated with resilience to a far greater degree. We need to better understand psychosocial, community, spiritual factors associated with resilience. And of course, we need a great deal of work on methods to enhance resilience in a neurobiological, psychosocial, community and spiritually.

Thank you.