Chapter 3

PREPARATION FOR DEPLOYMENT: IMPROVING RESILIENCE

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INTRODUCTION

With ongoing military operations in Afghanistan and Iraq involving multiple deployments for military personnel, there is growing interest in preparatory training activities that can increase service members' resilience to the stress of deployment. Service members are trained in numerous ways that promote adaptation to the stress, strain, and sacrifices of deployments. For example, physical fitness training, mission preparation, specialty role training, experiences that promote confidence in leaders and trust in peers, and messages that emphasize the purpose and function of mission goals are necessary ingredients to successful navigation of various deployment demands. It is not known whether these standard training activities enhance coping capabilities in the face of severe mission demands and traumas. Nor is it known whether existing training regimens effect risk for stress injuries and mental health difficulties linked to deployment stress. Finally, no systematic research has been conducted to date on preparedness interventions specifically designed to build psychological resilience and prevent the development of posttraumatic stress disorder (PTSD) in military personnel.

The lack of empirical literature to support unit preparedness interventions is compounded by the lack of an accepted or unified conceptual framework that defines the necessary and sufficient ingredients for resilience in the face of trauma. In addition, because most research on combat stress has been cross-sectional, little is known about risk, protective, and vulnerability factors, and the mechanisms, processes, and pathways of influence through which they exert their influence on trajectories of adaptation to deployment stress.[1] Unfortunately, the constructs used to define resilience are often extrapolated loosely or interchangeably. Furthermore, research in resilience, hardiness, coping self-efficacy, and biological components of resilience has been conducted within the areas of developmental pathology, trauma, and positive psychology, with little cross-referencing among these disciplines.[2]

Because of the high probability of exposure to severe stress and the extensive motivation to retain a ready and fit fighting force, the military is a natural laboratory to study the effectiveness of resilience-building strategies. What few findings do exist from the adult literature on resilience often come from studies of men in combat. These studies suggest that resilience is related to an ability to bond with a group with a common mission, a high value placed on altruism, the capacity to tolerate high levels of fear and still perform effectively, and psychobiological factors related to a low tendency to dissociate.[3] This chapter will extrapolate from theoretical models about resilience as well as related fields investigating stress, traumatic stress, and recovery from trauma. The goal is to generate an agenda for resilience training that can be examined in future research.

THEORETICAL MODELS OF STRESS, TRAUMA, AND RESILIENCE

It is necessary to first define theoretical models and core constructs related to stress, trauma, and resilience, as well as the implication of these models for preparation and early intervention.

Stress

Research on posttrauma mental health belongs to the broader field of stress research. Stress theory generally assumes that external *demands* (the traumatic event as primary stressor) evoke *responses* that draw on internal and external *resources*. Loss of resources, either concrete (social, financial) or symbolic (beliefs, expectations) may, as secondary stressors, significantly impact the recovery trajectory.[4] Survivors' own responses (anxiety, insomnia, depression) may additionally tax overall resources, becoming tertiary stressors.[5] With sufficient infusion of resources and the passage of time, recovery is the expected outcome of time-limited exposure to a stressor (with great variation depending on the intensity and duration of the stressor[6]). Stress management typically involves identifying and ameliorating those factors that interfere with recovery (lack of supportive others, ongoing stressors, maladaptive beliefs), and providing the resources that help support, organize, and make a plan for survivors.[7]

Trauma

There is no single cause of maladaptive responses to trauma. Traumatic stress theories often draw on psychological and biological research that has identified and mapped processes distinctly reactive to traumatic stress.[8,9] These findings support the proposition that when traumatic responses are overwhelming, uncontrollable, and involve extreme physiological arousal, they may consolidate the link between fear and traumatic recall, leading to avoidance, repeated recall, and ultimately to PTSD. Additional adversity, such as that often seen in the aftermath of extended deployments,

can create a chain of mutually reinforcing reactions that may be present forever in a person's memory.

Ehlers and Clark's[10] cognitive model of trauma suggests that preventive interventions focus on reframing negative appraisals of posttraumatic reactions, help individuals to distinguish between past and present threat, and help them process intrusive recollections. Specifically,

- Individuals are at higher risk for persistent PTSD when they make excessively negative appraisals of the trauma and exhibit disturbed memory processes such as poor elaboration and contextualization, strong associative memory, and strong perceptual priming. If individuals appraise their reactions to trauma negatively, they are at risk for enduring PTSD.[11] Therefore, helping individuals to reframe their reactions in a more neutral or positive light should reduce the likelihood of long-term PTSD.
- Because a central process in PTSD is an inability to distinguish past trauma associations of threat with current conditions, Ehlers and Clark advocate interventions that assist with contextual discrimination of past and present circumstances via cognitive therapy.

Intrusive recollections are natural responses to severe and salient life events. Processing (sharing, articulating in a therapeutic manner) incongruous, intrusive, distressful, and unremitting recollections, as well as examining and correcting the cognitive and behavioral responses to them, are the unique factors that should be addressed by trauma interventions above and beyond stress and negative affect management.[12]

Recovery following traumatic stress is promoted by individually chosen disclosure and social support; the perception that the social milieu accepts one's reactions and welcomes disclosure; seeing oneself as a hero or survivor rather than victim; a sense of relationship with "God," a higher power, or some philosophical sense of meaning; and trauma-focused treatment that helps reframe negative reactions, process intrusive recollections, and assist in distinguishing past from present threat.[13] Posttrauma social support and relatively fewer posttrauma negative events may serve as protective factors mediating posttrauma recovery.[14,15]

Resilience

The American Psychological Association Task Force on Promoting Resilience in Response to Terrorism defines resilience as "the process of adapting well in the face of adversity, trauma, tragedy, threats, or even significant sources of stress."[16] It cites many studies showing that the primary factors in resilience are (*a*) caring relationships within and outside the family that create love and trust, provide role models, and encourage and reassure; (*b*) the capacity to make realistic plans and implement them; (*c*) self-confidence; (*d*) communication and problem-solving skills; and (*e*) the capacity to manage emotions. It is generally accepted that resilience is common and derives from the basic human ability to adapt to new situations.[17]

Most research on resilience comes from developmental psychopathology, where initially researchers tried to identify general characteristics associated with resilient recovery from stressors.[18] These general characteristics included hardiness, efficacy (both self and collective), and neurobiological components of resilience.

Hardiness

Research with hardy individuals suggests that they have various personal attributes that may foster resilience. They report seeking help and building large support networks, reframe their experiences more positively (difficulties as leading to benefits); believe they can change a stressor or recover from its detrimental effects; endorse focusing selectively on the positive effects of severe life challenges; view themselves as controlling their fate; are committed to meaningful goals; view stress as a surmountable challenge; are less likely to endorse behavioral disengagement, denial, mental disengagement, and use of alcohol to confront stress; and are more likely to describe themselves as problem solvers.[19–21]

Maddi and Kobasa[22] studied healthy executives to discern the methods they used to increase "mental toughness." They found hardy people were committed to their work (they have a mission they believe in), have a sense of control over what happens in their life, and zestfully seek and take on challenges, feeling they will learn from the experiences. They seldom get sick.

Coping Self-Efficacy

A sense of being able to be effective in the world is the foundation of human agency (the power to originate actions for a given purpose).[23] Unless people believe they can produce desired results and forestall detrimental ones by their actions, they have little incentive to act or to persevere in the face of difficulties. It is partly on the basis of efficacy beliefs that people choose what challenges to undertake, how much effort

to expend in the endeavor, how long to persevere in the face of obstacles and failures, and whether failures are motivating or demoralizing. Benight and Bandura[24] recommended that individuals be taught to set achievable goals, which will enable them to have repeated success experiences as well as to establish a sense of environmental control, thus increasing their resilience. Moreover, teaching new problem-solving skills can increase an individual's sense of coping efficacy. A strong sense of coping efficacy, in turn, reduces vulnerability to stress and depression in taxing situations and strengthens resiliency to adversity.

Collective Efficacy

Social cognitive theory extends the conception of individual efficacy to "collective agency,"[25] which is particularly relevant to the military. People's shared belief in their collective power to produce desired results is a key ingredient of collective agency. The findings taken as a whole demonstrate that the stronger the perceived collective efficacy, the higher the group's members aspirations and motivational investment in their undertakings, the stronger their staying power in the face of impediments and setbacks, the higher their morale and resilience to stressors, and the greater their performance accomplishments. Both at the societal and individual level of analysis, a strong perceived efficacy fosters high group effort and performance attainments. Military leaders' efforts to shape collective efficacy require merging diverse self-interests in support of common core values and goals.

Military communities play a proactive role in the resilience-building process by planning and constructing environmental conditions to promote preparedness, leadership, and support.[23,25] Social resources, such as social support, socioeconomic status, and access to services, have shown strong effects on mental health and played a variety of roles in the stress process.[26] Mediational analyses show that social support provides its benefits to the extent that it raises perceived self-efficacy to manage environmental demands.[27]

However, beyond receiving positive social support, a number of research studies indicate that it is not positive social support, but negative social support, that affects recovery. Dunmore, Clark, and Ehlers[28] reported that perception of negative social interactions, rather than perceived positive support, predicts chronic PTSD. It would appear that the military would benefit from programs that build and maintain buddy support (including conflict resolution), model and reinforce social support, and teach strategies for providing support and understanding to those service members, for whatever reason, who express dissatisfaction or show signs of disengagement and withdrawal.

Neurobiological Factors

Neurobiological factors play a central role in the capacity to tolerate stress and trauma. Twin studies have found that overall heritability of PTSD ranges from 28% to 33%.[29] DNA (deoxyribonucleic acid) studies have found that a variety of gene polymorphisms contribute to stress reactivity and possibly the development of trauma-associated psychopathology. Examples include differences in sympathetic nervous system activity (polymorphism of the α-2C-adrenergic receptor gene),[30] cortisol release in response to psychosocial stress (glucocorticoid receptor gene variant),[31] and serotonin metabolism (polymorphism of the serotonin transporter gene).[32]

The role of serotonin metabolism in stress reactivity was studied by Caspi,[32] who found that a functional polymorphism in the promoter region of the serotonin transporter gene moderated the influence of stressful life events on the likelihood of developing depression. Among individuals who had experienced childhood maltreatment, those with two long alleles were significantly less likely to develop depression than those with two short alleles. Thus two long alleles appear to protect against trauma-related psychopathology while two short alleles are associated with vulnerability to trauma. Of note, it appears that environmental factors can serve a protective role even among those with a genetic vulnerability. Kauffman[33] recently found that strong social support protected against the development of depression in traumatized foster children, even among those with genetic vulnerability (ie, two short alleles of the serotonin transporter gene).

A wide variety of hormones, neurotransmitters, and neuropeptides that are known to be activated by stress and trauma are also thought to be associated with resilience. In a comprehensive literature review, Charney[3] highlighted eleven neurochemicals that appear to have particular relevance to the neurobiology of resilience. The evidence posits that resilient individuals will score in the highest range for measures of dehydroepiandrosterone (DHEA), neuropeptide Y (NPY), galanin, testosterone, serotonin (5-HT1a), and benzodiazepine receptor function. These same resilient individuals will score in the lowest range for hypothalamic-pituitary-adrenocortical (HPA) axis, corticotropin-releasing hormone, and locus-caeruleus-norepinephrine activity. The findings are opposite for those individuals vulnerable to stress. For example, NPY is an amino acid that helps to maintain sympathetic nervous system reactivity within an

optimal range. Under conditions of danger, the sympathetic nervous system (SNS) releases epinephrine and norepinephrine (NE) as part of the fight–flight response. During these high-stress situations, NPY is also released and helps to inhibit continued release of NE so that the SNS does not overshoot and possibly contribute to anxiety, hypervigilance, and fear. High levels of NPY during extreme training stress have been associated with adaptive performance in Special Forces soldiers. It is likely that robust increases in NE are held in check by similarly robust increases in NPY among these highly resilient soldiers.[3,34,35]

Galanin and DHEA are two other neurochemicals that may enhance resilience by containing or modulating the stress response.[3] For example, cortisol is released during stressful situations and helps to mobilize energy stores and increase arousal, selective attention, vigilance, and consolidation of emotional memory, all of which tend to be adaptive. However, when cortisol remains chronically high and unchecked, it can have toxic effects on the body and brain.[36,37] DHEA, which is released with cortisol, helps to lower levels of cortisol, and thus has protective effects.[35] Like NPY, high DHEA-to-cortisol ratio has been associated with better performance in Special Forces soldiers during high-stress training exercises and may play a role in modulating psychological, physiological, and behavioral responses to stress.

It is likely that individual neurobiological factors by themselves have relatively limited impact on stress resilience. However, in accordance with a model of allostasis,[38] the additive effects of multiple neurobiological factors may have a substantial effect on resilience. Thus, Charney[3] hypothesized that resilient individuals might be those with relatively high stress-induced NPY, galanin, DHEA, and testosterone, and relatively low stress-induced SNS and HPA-axis activation.

Numerous brain regions and neural pathways involved in the processing and regulation of fear, learning, memory, reward, emotion, motivation, and social behavior are also undoubtedly involved in resilience to stress. For example, resilience may be associated with optimal stimulation or inhibition of prefrontal cortical-amygdala circuitry, which would facilitate appropriate and adaptive responses to stressors. Similarly, the capacity for mutual cooperation, social bonding, positive emotions, and hope in the face of adversity, all of which have been associated with resilience, may be dependent on well-functioning reward circuitry involving the nucleus accumbens dopamine system.[3,34]

It is likely that relevant neurotransmitter and hormone systems, as well as neural pathways, can be modified by experience. Developmental studies have shown that early experiences with stress can have long-term effects on behavioral and neurobiological responses to future fear and stress.[38] Thus, uncontrollable or overwhelming stress during infancy can cause exaggerated emotional, SNS, and HPA-axis responsiveness to future stressors even into adulthood. Mild-to-moderate stressors that are controllable can have a "steeling" or stress inoculating effect, where the organism becomes less reactive to future stressors.[39] Although attention and arousal are necessary for survival, going outside an optimal range has detrimental biological effects. During stress, multiple cortical and subcortical brain regions (including sensory, motor, prefrontal and cingulate cortex, hippocampus, amygdala, thalamus, striatum, midbrain, and brain stem monoaminergic nuclei and hypothalamus) become activated. Communication between these regions facilitates evaluation of, psychomotor response to, and memory for stress-related events. Although arousal may be life saving, it has been hypothesized that excessive and sustained arousal following trauma may increase the likelihood of developing PTSD.[5,40,41] Numerous animal studies have shown that extended and excessive states of alarm and arousal may contribute to stress sensitization and long-term potentiation,[42] both of which likely contribute to trauma-related psychopathology.

Understanding and working with biological components of resilience is an area with great potential for intervention. Based on the neurobiological findings on use-dependent neuroplasticity, it is likely that certain preparation and training regimes will alter relevant neural and neurotransmitter systems that are involved in resilience to stress. These include training to regulate emotions, face fear, dispute and reappraise negative cognitions, find positive meaning in adversity, help others in need, and attract social support.

Defining Resilience

Resilience is generally considered to be "multidimensional,"[18] with different characteristics expressed variably across many areas of the individual's life (eg, occupation and social). These "resilient trajectories" may be uneven.[18,43] For example, an individual may function adequately in work settings following a trauma but suffer from interpersonal numbing or withdrawal. Furthermore, the expression of resilience is influenced by context: the quality of the stressor, the individual's traits, and the surrounding culture.[43] Many researchers in this area conclude that resilience is not a fixed attribute but a type of "functional trajectory" dependent on circumstances and individual variations (eg, vulnerability and protective mechanisms) in response to

risk. If circumstances change, resilience trajectories can change.[18,44]

Multidimensional analysis indicates that resilient behavior in one domain may extract a price in another; for example, competence in work domains may involve emotional detachment from family problems,[45,46] and at-risk individuals with exemplary behavior may experience internal distress.[47,48] Finally, there has been some acknowledgment that the factors that bolster resilience may not be adaptive in all domains (ie, sociopathy and narcissism[13]).

Experts in the field of resilience hold that all plans for research and intervention should clearly define resilience as a state, not a trait.[18] Therefore, they recommend avoiding the term "resiliency," with its connotation of a trait. Rather, it is recommended to use the phrase "resilient trajectory or adaptation," explaining that these trajectories vary across situations and within individuals at different times.[18]

Indeed, resilience is both a process and an outcome. There are resilient outcomes (eg, in the face of enormous combat traumas, a service member does not develop any mental health problem or significant problems functioning) and there are resilient processes (mechanisms that create resilient outcomes), which change over the life-course, as demands, circumstances, and service members change. The goal of resilience training is to promote or augment existing personal and social resources and create new resources that contribute to adaptation.

EVALUATING RESILIENCE OUTCOMES

Three things are necessary to evaluate resilience as an outcome: (1) the nature of the exposure to trauma; (2) the prevalence of symptoms and problems, with an emphasis on the degree of subjective distress and suffering; and (3) functional capacities in diverse areas (eg, work, leisure, self-care, relationships). However resilience is operationalized, successful adaptation or recovery from deployment trauma within and across service members is dependent on the nature of the trauma and the extent of exposure to war-zone events. It is inappropriate to compare resilience across individuals without accounting for variability in exposure to trauma. In the case of severe and extensive war-zone trauma, resilience should not be narrowly defined as the absence of posttraumatic mental health disorders, such as PTSD. Service members will report a variety of symptoms reflecting the enduring psychological impact of their deployment experiences. What should define resilience is not the mere absence of symptoms, but the degree of subjective distress caused by these problems and, more importantly, the extent to which their functioning is compromised.[49]

In terms of studying resilience as a process, measures need to be developed to evaluate individual differences in protective factors and processes, so that studies can test potential mechanisms mediating exposure to trauma and outcome. Other goals would be to describe the prevalence of various resilience indicators in a given trauma context across time and to evaluate the efficacy of interventions designed to promote resilience. What mechanisms or processes facilitate resilience at a given posttraumatic interval? One way to look at resilience is that resources and strengths in the individual and in the group's culture (eg, a cohesive and supportive squad in the military) outweigh the influence of liabilities and weaknesses. In this context, individual and social resources are used to: (*a*) manage posttraumatic demands; (*b*) find meaning, purpose, and hope; (*c*) reduce or eliminate current adversities and stressors; and (*d*) derive positive feelings from various repertoires of activities (eg, work, leisure). In research on resilience, it is particularly important to recognize that the process of resilience lies in both the individual and in the environment (and the transaction of the two). A thorough evaluation of resilience resources should take into account social-demographic factors, current adversities, social networks, and intimate relationships.

MEASUREMENT OF RESILIENCE FACTORS IN THE MILITARY

The *Deployment Risk and Resilience Inventory* (DRRI)[50,51] treats resilience as an unfolding process and multidimensional construct, with the individual, exposure characteristics, and the social milieu (within the military and in the home) seen as equally important. It was developed based on literature review, survey and focus group input, and confirmatory factor analysis, to assess risk and resilience variables that are related to health and well-being following military deployments. The DRRI assesses risk and resilience in 14 domains, divided into prewar factors, war-zone factors, and postwar factors.

Prewar Factors:

1. Childhood family environment (cohesion, closeness of family)
2. Prior stressors (exposure to highly stressful

or traumatic events)

War-Zone Factors:

3. Preparedness (perceived preparedness, including belief in quality and quantity of equipment, supplies, and training)
4. Combat (exposure to objective warfare experiences)
5. Aftermath of battle (observing or handling remains, dealing with prisoners of war, exposure to devastated communities and refugees)
6. Perceived threat (subjective fear for one's safety and well-being in war zone)
7. Difficult living and working environment (day-to-day pressures, discomfort, deprivation)
8. Concerns about life and family disruptions (career-related concerns, family concerns)
9. Sexual harassment (exposure to unwanted sexual touching or verbal conduct)
10. General harassment (harassment on basis of biological sex or minority status)
11. War-zone social support (assistance and encouragement from leaders, other unit members)
12. Nuclear, biological, and chemical exposures

Postwar Factors:

13. Postwar social support (emotional sustenance and instrumental assistance from family, friends, coworkers and employers, community)
14. Postwar stressors (general stressful events such as accidents, illness; reintegration issues such as job interruption, difficulties reestablishing roles)

Because the DRRI is specifically geared to evaluate adaptation to deployment stress and trauma, and is psychometrically sound, its broad use is recommended. However, the DRRI does not measure individual differences in psychological resilience, which is also an important personal resource. Prior to enlistment, all service members possess varying degrees of an innate and acquired capacity to manage serious life challenges and threats effectively (resilience). Unfortunately, there is no "gold standard" method of evaluating resilience as a individual characteristic, which should not be surprising because there is no unified conceptual or definitional framework. One measure that has been found to have adequate content coverage is the Connor-Davidson Resilience Scale,[52] which is a 25-item questionnaire tapping attitudes about coping with adversity (eg, "having to cope with stress makes me stronger"). Items require respondents to indicate their degree of endorsement on a five-point scale ranging from not true at all to true nearly all the time. Connor and Davidson reported a Cronbach's alpha of .89 in a validation sample of general population subjects, which shows that this instrument is highly likely to elicit consistent and reliable response even if questions were replaced with other similar questions.

The National Center for PTSD is developing a measure called the Response to Stressful Experiences Scale, which seeks to measure resilience. The scale has been structured to cover the following putative mechanisms of resilience:

- **Behavioral**. The actions (active or passive) an individual exhibits in response to an intense life stressor that facilitate a return to psychological baseline functioning or to psychological growth, including actions aimed at marshalling social support.
- **Emotional**. The degree of effectiveness regarding how to use one's emotions to achieve one's goals. This is accomplished by managing emotional reactions in a flexible, situation-appropriate manner.
- **Cognitive**. Conscious thoughts, perceptions, and expectations aimed at adapting to, or overcoming, stressful situations by orienting one's beliefs when useful, to include a realistic and accepting stance about personal vulnerability, the likelihood of future risks, and the ability to achieve personal growth.

It is hoped that by measuring multiple domains, a more useful and accurate level of resilience can be obtained.

INTERVENTIONS FOR BUILDING RESILIENCE AND PREPAREDNESS

It could be argued that the military continuously fosters resilience in service members from recruitment and basic training to retirement. It is beyond the scope of this chapter to catalog and operationally define all the resilience-building efforts in the lifespan of a service member. Instead, this discussion will focus on efforts that occur or should be considered to lessen the mental health impact of various deployment

hardships, adversities, and serious traumas (primary prevention).

It is unclear at present whether preparation is likely to inoculate individuals fully against severe trauma. A number of strategies extrapolated from different fields are described as possible components of preparation and prevention. One factor that needs consideration is that preparation requires motivation, foresight, and time and energy, which may not be realistic and cost effective under all circumstances. If preparedness is not feasible, research suggests that preventing resource loss is more efficient in promoting recovery than attempting to introduce additional resources following a traumatic event.[6] Other programs designed to prepare individuals are discussed next.

Toughening Responses to Stress

Can individuals become better prepared for deployment and combat? The literature on "toughness" suggests that under certain conditions, repeated episodes of challenge or threat followed by recovery periods (eg, aerobic exercise and working in cold environments) can "toughen" the neuroendocrine system's response to stress. People who undertook programs of aerobic training, for instance, were subsequently more energetic and more emotionally stable than they were before such an experience.[53] Better performance and learning in even complex tasks was associated with greater adrenergic responsiveness in humans.

Toughness is less relevant, however, to situations experienced as harm or loss, where negative outcomes already have occurred, or where instrumental coping is considered useless (eg, one can overwhelm organisms with excessively intense, extended, or unexpected training; even a single episode of a traumatic stressor can overwhelm). Combining unpredictability with great severity may overwhelm the organism's capacity to recover, leading to weakness rather than toughness.[54]

Building Strengths Through Training Programs

A recent expert panel reached consensus that any intervention program designed for situations of ongoing threat should incorporate elements designed to foster hope, safety, efficacy, calming, and connectedness.[55] Learned optimism and positive psychology models[56,57] incorporate many of these components to build strengths in people at risk. The components they apply to strength building and prevention include: instilling hope; building buffering strengths (ie, interpersonal skill, optimism, perseverance, capacity for pleasure, and purpose); narration, or the telling of stories about one's life to another; and disputing (the skill of recognizing one's own catastrophic and exaggerated thinking and effectively disputing it).

Seligman has found that such training is self-reinforcing and prevents depression and anxiety in children and adults. This training is unique in that it focuses on building strength rather than repairing damage. Seligman's intervention programs are called "training programs" rather than therapy, and yet they have similar beneficial effects as psychotherapy.[57–59]

Building Resilience Through Self-Help Programs

The American Psychological Association has recently placed an online module on building resilience on its self-help Web site.[16] Leading researchers in the field of resilience and posttraumatic growth formed the committee that created the module. The Web site explicates basic self-help steps for improving resilience, based on empirical and consensus information: increasing social support, optimism, realistic appraisal and goal setting, emotional and social balance, and a mix of both problem-focused and emotion-focused coping. Because literature on adult learning suggests that self-paced instruction is important to successful mastery of material, this dissemination strategy may be highly effective in assisting soldiers with their own recovery course, particularly those who are worried about stigma involved with seeking assistance, and whose schedules are busy.

Teaching Skills Commonly Utilized During Survival Situations

Another approach to training resilience is to interview those who have survived highly stressful circumstances to gain an understanding of common factors that are helpful in survival. For instance, a recent case study[60] illustrates that the use of problem-solving techniques in trauma survivors enabled them to retain a sense of efficacy and control during life-threatening situations. Examples of strategies employed by survivors include the following:

- recalling and practicing skills from previous education about the situation they were in (ie, safety and breathing);
- having confidence in friends to help;
- analyzing everything closely, and demanding results;
- dismissing thoughts of death as unconstructive;
- concentrating on how to pacify the person making the threat;
- feeling a sense of control;
- remaining calm;

- thinking of loved ones;
- prayer;
- concentrating on positive coping actions; and
- not letting sounds or sights distract them.

Basic survival skills have been delineated by Gonzales,[61] who conducted case studies and interviews with hundreds of people who had survived life-threatening situations. The following list includes the six factors that are commonly observed across those who survived dangerous situations.

1. Knowing as much as you can about the situation ahead of time, keeping in mind that the forces may be so large (or fast) that they are difficult to imagine.
2. Being adaptive and flexible, based on a true reading of the environment, and changing behavior accordingly.
3. Quickly organizing, setting up routines, and instituting discipline; breaking down very large jobs into small, manageable tasks; setting attainable goals and developing short-term plans to achieve them; and dealing with what is within your power from moment to moment and leaving the rest behind.
4. Knowing your abilities and not over- or underestimating them.
5. Being able to assess and stop if it is clear that the environment does not support going forward, no matter how much you have planned; being realistic about goals and timeframe, then being content with just being in the process.
6. Cultivating a positive mental attitude by:
   - Realizing that life is not always fair.
   - Having fortitude, patience, courtesy, modesty, decorum, and the will (in the worst of situations) to do your best.
   - Celebrating successes, and taking joy in completing tasks, even small ones.
   - Creating an ongoing feeling of motivation, preventing hopelessness, and giving yourself small breaks from the stress of the situation.
   - Being determined to be careful and do your best, and becoming convinced that you will succeed.
   - Not becoming discouraged by setbacks; accepting that the environment is constantly changing; picking yourself up and starting the entire process over again, if necessary, in manageable steps; and embracing the world in which you find yourself and seeing opportunity in adversity.

Military personnel may be better prepared for deployment stresses if they have specific information to help them master life-threatening situations and are instructed in how to use this as part of their problem-solving strategy. In addition to teaching skills for specific situations, it may be important to prepare individuals to cope with unexpected situations where they may feel confused, bewildered, or helpless. Bell's[62] resilience program seeks to address these issues through the use of esoteric training principles, including meditation exercises that develop steadiness, clarity, pliancy, mindfulness, and emotional endurance. These principles, however, have not been tested in situations of traumatic stress.

Reinforcing Skills Through Military Training

Military training focuses on preparation of personnel for battle or other chaotic and disastrous situations. The US military strives to prepare its soldiers for potential exposure to combat, operations other than war, and the stresses of deployment in many ways. In combat units, there are many hours devoted to field training exercises (some quite long), to include exposure to live fire, with reduced sleep, at a high pace of operations. Those trained at the Suvival, Evasion, Resistance, and Escape (SERE) schools undergo extremely stressful mock captures and interrogations at a simulated prisoner-of-war camp. Training in nuclear, biological, and chemical warfare is also standard, including maintenance of the gas mask and donning the mask within 9 seconds. Especially overseas, there are exercises in wearing the chemical protective suit for long periods of time while performing one's job. The constant repetition and standardized measures of mastery are intended to foster a sense of control for the service member, at the same time sending the message that "we are prepared for anything that may come our way down range."

Unit cohesiveness is another critical protective factor in war. Spiegel[63] speculated that it was regard for comrades, respect for leaders, concern for the reputation of the group, and an urge to ensure the success of the unit that kept soldiers fighting in World War II.[64] Furthermore, he identified that when individual's decompensated it was often after a change in the soldier's relation to the group.[63] During the Vietnam War, it was observed that ultimately this unit cohesiveness does not represent an altruism born of interpersonal attraction but rather the realization that a soldier's survival depended upon his ability to make others willing to help him in his own time of need.[65] This cohesiveness can extend throughout an entire organization, with the

unit serving as an extension of individual pride. The soldier's self-esteem becomes linked to the reputation of the unit, providing additional motivation. In other words, an individual's identity is not just about self but also incorporates a collective identity that, when well developed, is a protective factor.

Physical fitness is also an essential component of military training. Throughout their career, service members must take a physical fitness test twice a year. This ensures that service members maintain at least a reasonable degree of physical fitness, despite having many other taskings. In the elite units, physical training is a high priority. In addition to preparing soldiers for the physical exertion necessary in battle, physical fitness has also been strongly linked to reductions in stress, anxiety, and depression.[66]

Drills and exercises are another component of preparedness and building resilience. In the Navy, for example, the drills may be centered on reacting to fires, the ship sinking, "man overboard," and other mishaps. These exercises utilize the constructs of stress inoculation, which in the civilian world takes the form of cognitive-behavioral methods to anticipate and diminish responses to anxiety-provoking events, with the aim of reducing the response to a perceived threat.[67] Beyond enhancing cognitive knowledge, exercises in the military encourage bonding and a sense of mastery about disaster. Some of the military survivors of the September 11, 2001, attack on the Pentagon believed that previous drills prepared them for the chaos of the exit, while civilian employees complained that they were underprepared.[68]

Despite the potential benefit of stress inoculation and drills, recent experience has shown that many military members are not prepared for the sights and smells of civilian casualties, nor the experience of handling the bodies of their friends or the enemy. For example, after the USS *Iowa* explosion, when shipmates handled the bodies of their friends, several developed PTSD symptoms.[69] The US Army has developed a pamphlet, *Just the Facts . . . Dealing With the Stress of Recovering Human Dead Bodies*, to provide guidance on how troops should handle remains in order to reduce stress levels.[70] What is not currently known, however, is the best assortment and intensity of stimuli to prepare people, rather than oversensitize them.

In the military, leadership is always emphasized. Military leaders are taught to foster hardiness, unit cohesion, and morale by "leading by example"; facilitating open communication regarding how missions are planned; stating how mistakes or failures are corrected and learned from; seeking out (and creating if necessary) meaningful and challenging group tasks; remaining aware of the basic needs of the team (to include the need for rest); and providing opportunities for all individuals to make use of their unique coping skills (to include prayer or writing letters home). A study conducted with a group of Norwegian navy officer cadets demonstrated that units that increased significantly in cohesion after a stressful exercise also rated their leaders as better skilled and more caring and concerned compared to units that did not increase in cohesion. Individuals who see their leaders as more effective and concerned, even when these leaders are under extreme stress, are in turn more likely to interpret the experience positively. For group tasks, this positive interpretation is reflected in increased group cohesion.

Another component to which the US military pays particular attention in preparation for deployment is the "state of affairs at home," because emotional support has been shown to affect the impact of deployment.[71] Data from the Israeli Defence Forces, for example, show that 30% of their casualties in the Lebanon War were caused by combat stress reactions. The Israeli Defence Forces found that soldiers who had experienced certain marital discord or stress in personal relationships were at high risk of suffering combat stress reactions.[72] Recently, the US Army has developed a vigorous deployment cycle support plan called Battlemind[73] to help reintegrate returning soldiers into their families and society, especially those who have been wounded. The Navy and Marine Corps have developed a multifaceted program centered around acknowledgement that stress reactions, injuries, and illness fall on a dimensional combat and operational stress continnum, with efforts to intervene with both service members and their families early in the continuum to reduce long-term problems.[74–76]

Finally, the military has been increasingly sensitive to properly recognizing the deceased. Following the attack of the USS *Cole* the leadership made a concerted effort to ensure that the deceased were given a proper military burial and that the survivors were allowed to pay their respects. By putting the crew to work to ensure a proper burial, the leader was giving the crew back a sense of control, sending the message to the survivors that each life is valuable and will be treated with due dignity, especially in death, and beginning the mourning process for those more closely linked to those lost.[77]

SUGGESTIONS FOR FUTURE RESEARCH ON RESILIENCE

Primary prevention and training prior to stressful military situations often involves interventions such as teaching problem-solving skills or toughening exercises like those in military training. This form of

stress inoculation is designed to foster "resistance." However, by its nature traumatic stress is unpredictable and uncontrollable. Therefore, although stress resistance is related to specific or probable stressors, traumatic stress preparation should be geared more toward preparing individuals for the unexpected, when they may not yet understand what is going on, when conditions are new, and when they may feel confused, bewildered, or helpless.

Another strategy seeks to enhance resilience by teaching certain factors that have worked for others following traumatic or stressful situations, such as social support and self-efficacy or positively changing beliefs or actions. This approach may involve building restorative, replenishing activities into the posttrauma schedule, having individuals try to find what might restore their inherent capacity to thrive, and raising awareness about the cost and benefit of denial at different phases postincident. Programs need to prepare for active outreach and assistance for weeks and months following deployment.

It is important to keep in mind that what works for individuals in one context may not work for the same or other groups in others. A sensible research strategy for maximizing resilient trajectories before, during, and after deployment would be multidisciplinary, multifaceted, and sensitive to the context of the event, as well as to differential exposure and response. There is also a strong need to partner clinicians and researchers in designing and evaluating programs.

It is also important to remain cautious in any statement regarding what interventions can accomplish toward prevention of long-term functional and symptomatic impact. For example, it is unknown whether interventions are associated with significant improvements in functioning. Additionally, care should be taken to include the preferences of soldiers when an intervention is planned. Research on service utilization indicates that the majority of individuals exposed to a traumatic event will not choose to seek mental health services, and therefore a careful study of what interventions are acceptable and supportive of natural recovery trajectories may be called for prior to strong recommendations for any mental health intervention. A more acceptable intervention than individual crisis response might be to provide a "resilience training model" that is implemented as part of basic training for all military personnel, as well as providing family and friends with the tools necessary for helping loved ones more effectively process traumatic or enduring stress.

SUMMARY

This chapter has extrapolated from theoretical models about resilience, as well as related fields investigating stress, traumatic stress, and recovery from trauma, to generate an agenda for resilience training that can be examined in future research. The construct of resilience represents a dynamic process involving protective and vulnerability factors in different risk contexts and developmental stages, and thus is an area of considerable interest and importance to the military. However, the lack of empirical literature to support unit preparedness interventions is compounded by the lack of an accepted or unified conceptual framework that defines the necessary and sufficient ingredients for resilience in the face of trauma or resilience-building interventions to prepare soldiers for deployment.

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