

Key Facts on Resilience

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Background

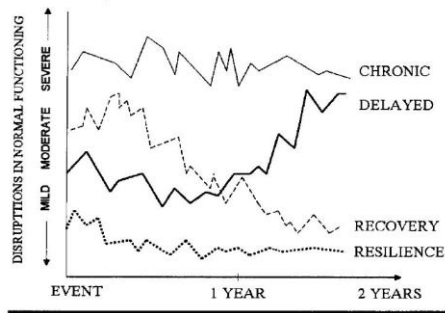
Resilience research holds promise for its potential to inform treatment of stress-related pathology. Likewise, a better understanding of the mechanisms that promote resilience can inform training programs aimed at preventing maladaptive responses to trauma (e.g., stress inoculation training). However, the emergence of programs offering methods to make individuals resilient suggests the term may be misunderstood. Resilience as a construct has traditionally lacked a consistent, complete and measurable definition. Such definitional ambiguity has partly contributed to the term being incorrectly applied and as a result, asymptomatic individuals are often deemed resilient. Moreover, what were previously known as treatment and training have been renamed “resilience building.” At best, such relabeling might reduce the stigma of traditional mental health treatment. At worst, an expanding use of the term may confound a growing database of evidence-based factors that really do differentiate those who do bounce back from stress from those who don’t. This paper aims to define resilience and provide a brief review of the literature that highlights the key psychosocial factors and biological markers of resilience.

Definition and Theory

Resilience is sometimes defined as a psychological process developed in response to intense life stressors that facilitates healthy functioning.¹ However, variations in the definition of resilience include the absence of adverse symptoms following trauma,² sustained performance during an intense physical or psychological challenge or maintenance of a positive outlook despite having experienced significant adversity.³ A vast literature indicates that the overwhelming majority of individuals exposed to life-changing stressors and military personnel exposed to combat do not develop stress-related psychopathology.^{4,5} Given the outcomes, the term resilience is often misunderstood as defining the norm. And as a result of this inflated and fallacious definition, any behavior or environment that promotes health can be misconstrued as a resilience factor.

It has been suggested that there is a distinct difference between recovery and resilience. A two-year longitudinal assessment of (N = 1828) survivors of natural disaster and terrorist attacks found empirical support for four distinct patterns of symptom change: resistance, chronic dysfunction, recovery and resilience.⁶ A similar pattern of disruption in normal functioning following exposure to traumatic stressors was illustrated by Bonanno (Figure 1).⁴

Figure 1
Prototypical Patterns of Disruption in Normal Functioning Across Time Following Interpersonal Loss or Potentially Traumatic Events



- The term *recovery* indicates that a degree of psychopathology is present for a period of time, typically upward of several months, following a traumatic event before returning to pre-trauma levels.
- The term *resilience* reflects the ability of individuals to maintain relatively stable mental function throughout the course of events.⁴

Alternatively, other researchers have described resilience as having three primary components: resilient qualities, the resiliency process and innate resilience. Resilient qualities measure the psychosocial qualities of resilient individuals. The resiliency process describes how the individual adapts to the traumatic event, and innate resilience consists of the identification of motivational factors that may influence the individual's response.⁷

Resilience is most easily conceptualized as having four prerequisites:

- 1) Risk or predisposition to biopsychosocial or environmental conditions
- 2) Exposure to a high-magnitude stressor
- 3) Stress response
- 4) Return to baseline functioning and symptom levels.

Prevalence

General Populations

Determining the prevalence of resilience in the adult population is difficult due to the term's subjective and diverse definitions. The 25-item Connor-Davidson Resilience Scale (CD-RISC) is commonly used to estimate resilience in a population. The total score ranges from 0-100, with higher scores indicating greater resilience.⁸ The 22-item Response to Stressful Experiences Scale (RSES) is another scale that has been validated exclusively in an active-duty and reserve military sample (N=1,014). The total score ranges from 0-88 and, like the CD-RISC, higher scores indicate greater resilience.^{1,9}

Prevalence of resilience among different populations⁸	
<u>Population</u>	<u>Mean (SD) CD-RISC score</u>
General population	80.4 (12.8)
Primary-care outpatients	71.8 (18.4)
Psychiatric outpatients	68.0 (15.3)
Generalized Anxiety Disorder	62.4 (10.7)
PTSD	50.3 (20.0)

Of 764 participants responding to a victimization survey, the mean score on the abbreviated CD-RISC (10-item) was 31.78 (SD = 5.41; range = 9–40).¹⁰

Of participants within a household survey (N= 3,581), the prevalence of resilience was 14.5% one year following such adversities as functional limitation; bereavement or marital separation; or poverty (quantified using changes in the General Health Questionnaire over time).¹¹

Military Populations

Among Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) veterans (N=272), the mean resilience score was 77.4 out of 100 for participants without PTSD (using the CD-RISC). Participants with PTSD had a mean score of 59.5.¹²

OEF/OIF veterans (N=103) seen at the National Center for PTSD within the VA Connecticut Healthcare System had a mean score of 67.0.¹

Prevalence of resilience among military populations¹	
<u>Population</u>	<u>Mean (SD) RSES score</u>
Navy corpsmen	67.3 (11.0)
Active duty*	60.2 (12.4)
Veterans of OEF/OIF	55.7 (14.8)

* Sample consisted primarily of Army National Guard (~74%) and Marines (~25%)



Demographic and Environmental Predictors

Gender is an inconsistent and unreliable predictor of resilience. In a study conducted with crime victims, women reported lower resilience scores;¹⁰ however, an earlier study by the same authors found no significant difference between genders (z -score=0.05-1.09).¹³ Yet another study found that women were more resilient compared to men, with this gender difference stronger among older women than younger women.¹¹

Diminished resilience scores were noted among individuals with lower levels of education and income, and individuals with histories of childhood maltreatment.¹⁰

Resilience increased with extroverted and conscientious traits. The correlation between resilience and conscientiousness was stronger for members of ethnic minority groups than for Caucasian participants. It was speculated that the hardships faced by ethnic minorities were mitigated by task-oriented coping strategies, and there was perhaps a culturally placed value on conscientiousness. This hypothesis needs further investigation before generalizations can be made.¹³

According to one study², the relationship between resilience and PTSD is dependent on the specific details of the trauma.*

* This study relied on the premise that the sub-clinical or no PTSD means being resilient.

- As PTSD increased, resilience decreased. Individuals who were exposed to the September 11th World Trade Center attacks were more likely to be resilient (have less than 0 or 1 PTSD symptom; 65.1%) than to be in the recovery phase (2 or more symptoms; 28.9%) or have probable PTSD (6.0%).
- If a person was injured, PTSD increased and resilience decreased. People who were physically injured had a relatively high PTSD prevalence (26.1%) and relatively low resilience prevalence (32.8%) compared to all individuals involved in the attack (i.e., those who lost possessions, were involved in the rescue efforts or had friends who were killed).
- If personal possessions were lost, PTSD and resilience increased. Respondents who had lost possessions in the attack also had a high PTSD prevalence (21.4%) but were more resilient (42.6%).

Resilience Factors Discussed in the Literature^{14, 15}

One of the most significant barriers in resilience research is the assumption that a lack of disease constitutes resilience. The absence of a standard definition of resilience can lead one to conclude that any construct that promotes health leads to resilience. The factors validated in the CD-RISC included personal competence, trust in one's instincts or tolerance of negative effects, positive acceptance of change, control and spiritual influences. The following factors were included in the validation of the RSES: positive appraisal, spirituality, active coping, self-efficacy, meaning/learning and acceptance of limits.



Although some of the commonly referenced resilience constructs are outlined below, it is difficult to say whether they are all valid and reliable factors due to the way in which resilience was defined in the various studies. More research is necessary to determine if these factors impact resilience.

- **Active coping style -**

Problem-solving and managing emotions that accompany stress; learning to face fears.

Task-oriented coping was determined to increase resilience, while emotion-oriented coping was associated with low resilience.¹³

- **Physical exercise -**

Engaging in physical activity to improve mood and health

- **Positive outlook -**

Using cognitive-behavioral strategies to enhance optimism and decrease pessimism; embracing humor

- **Moral compass/Spirituality -**

Developing and living by meaningful principles; putting principles into action through altruism

In a survey study of OEF/OIF veterans, subjects without PTSD had significantly higher resilience scores on all subscales compared to subjects with PTSD, with the exception of spiritual influence, which was not significant (“Fate or God can help” and “Most things happen for a reason”).¹²

- **Social support -**

Developing and nurturing friendships; seeking resilient role models and learning from them

The effect of social support on resilience is widely accepted. Studies have shown that resilient individuals were more likely to have more social support than non-resilient individuals. Moreover, those with high social support were 40% to 60% more resilient than those with low social support.¹¹

In another study, the authors determined that higher resilience and post-deployment social support were associated with decreased traumatic stress and depression symptoms. Resilience scores also were negatively associated with PTSD symptoms, and respondents with PTSD scored significantly lower on measures of unit support and social support.¹²

- **Cognitive flexibility -**

Finding good in adverse situations; remaining flexible in one’s approach to solving problems

- **Cognitive explanatory style -**

Place blame where it realistically belongs rather than blame oneself or others



- **Reappraisal -**

Ability to reframe an adverse event into a situation with a more positive meaning

- **Acceptance -**

Understand and believe that an event is happening or has happened

- **Stress inoculation -**

Have previously experienced a stressful event

Early life exposure to severe, uncontrollable trauma can cause long-term stress response damage, but exposure to milder events may build resilience.^{14, 16}

Relationship to Posttraumatic Growth

Posttraumatic growth is defined as a positive change as a result of experiencing a traumatic event.¹⁷ Whereas resilience refers to characteristics acquired prior to the traumatic event, posttraumatic growth has been described as going beyond resilience by transforming and building upon the experience to create a positive outlook. This growth process often takes time, during which individuals may report continuing distress following the trauma.¹⁸

The present study aimed to examine the interrelationship between resilience (defined by a lack of posttraumatic stress disorder following trauma) and posttraumatic growth. Across two studies of Israeli citizens, (1) children and adolescents following various traumas and (2) citizens and military personnel one year following the Lebanese War, the results showed that high levels of resilience were associated with the lowest posttraumatic growth scores, which imply that the constructs are inversely related.¹⁹

Biology

The precise roles of biological and genetic factors that contribute to a resilient response to stress are dynamic and complex. What we do know about biological and genetic resilience factors is largely correlative; therefore, claims about a particular candidate gene, allele or neuropeptide *causing* resilience is premature. A challenge is to determine whether biological factors associated with resilience are the consequence, or the cause, of being resilient.

A complete description of the genetic and biological variables that have been implicated in resilient response to stress is well beyond the scope of this paper. Biological and genetic factors that have been implicated in resilience include:



Association of Neurochemicals to Resilience²⁰

- **Human serotonin transporter gene (5-HTTLPR):** Also known as SLC6A4, the long allele is associated with increased serotonin availability, decreased risk of depression and stronger emotion regulation skills.
- **Neuropeptide Y (NPY):** Research conducted in high-intensity military settings (e.g., SERE) indicates that higher baseline levels of NPY are associated with better performance during prolonged stress. NPY is also associated with more efficient return of cortisol levels to baseline following activation of the HPA axis.
- **Brain-derived neurotrophic factor (BDNF):** BDNF has been implicated with adaptive responses to stress and enhanced learning under stress, primarily in research using rodents. However, the role of BDNF in resilience is not completely understood, as some findings suggest this nerve-growth factor has differential effects on various brain regions. Thus, an increased level of BDNF in one area is associated with increased risk for stress-related pathology, whereas in other areas it confers resilience-promoting properties.
- **Catechol-O-methyltransferase (COMT):** COMT is an enzyme that affects synthesis of two primary neurotransmitters, dopamine and noradrenaline (norepinephrine). COMT is negatively correlated with levels of dopamine and noradrenaline. Evidence suggests that decreased amounts of COMT are associated with emotional ability and poor tolerance of negative affect.
- **Dehydroepiandrosterone (DHEA):** DHEA is known to counteract the deleterious effect of elevated glucocorticoid levels found in the brain resulting from prolonged stress reactivity of the HPA axis. A study of U.S. Army Special Forces personnel undergoing combat diver qualification training found that higher levels of DHEA were correlated with better scores on an underwater navigation task.



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