RESILIENCE

Resilience is successful adaptation despite exposure to risk. It is a concept borrowed from materials science, which defines resilience as the ability of a material to absorb energy when deformed elastically and to return it when unloaded. To infer resilience in both humans and materials therefore two coexisting conditions must apply: (1) exposure to stress and (2) ability to withstand the impact of that stress. Resilience is not an attribute or personality trait that some possess and others do not. Rather, it is a developmental process which refers to the fact of maintaining adaptive functioning in spite of serious risk. It is also distinct from the related concept of positive adaptation because searching for resilience implies and expects that this positive adaptation occurs *despite* risk exposure. Furthermore, it tends to be specific. Those who meet the criteria for resilience in one domain and despite exposure to specific risks may not necessarily be doing well continually, in every possible circumstance, and in totality. The study of resilience, especially in the socio-emotional and behavioural domain, has received much attention, most notably in childhood and adolescence. The focus therefore in this entry is resilience in childhood and adolescence.

Central to the concept of resilience is the concept of protection and the search for promoting protective and eliminating vulnerability factors. Protective factors are attributes of persons, environments, situations, and events that relate to adjustment under conditions of adversity or risk. Vulnerability factors, on the other hand, are those attributes that relate to maladjustment under conditions of adversity or risk. Protective and vulnerability factors are the opposite ends of the same construct; they are not different constructs. For example, if level of parental affection is found to affect the adaptation of children experiencing adversity, parental warmth as the 'positive end' is the protective factor, whereas parental coldness as the 'negative end' is the vulnerability factor. The first landmark studies on childhood resilience, carried out in the 1970s by Norman Garnezy and Emmy Werner, focussed exclusively on individual protective factors, as did most studies that immediately followed. Subsequent research, however, acknowledged that protective factors can also be found in aspects of children's families and in characteristics of their wider social environments. More recent research therefore classifies protective factors at the level of the community (e.g., socially cohesive neighbourhoods or supportive schools), the family (e.g., parental warmth), and the child (e.g., cognitive ability or self-control).

This recent work on resilience has led to five important findings, in turn showing that understanding resilience is essential to understanding variations in response to stress and trauma. First, that factors that may be protective for those at risk are not necessarily associated with positive outcomes among those not exposed to that risk. For example, adoption, as an atypical experience, may carry some risk in the absence of serious risk experiences, but the adoption of an at-risk child (such as one who has been reared in an institutional environment or has been removed from parental care because of serious abuse or neglect) exerts a substantial protective effect. Second, that resilience may stem from the effects of repeated brief exposure to manageable risks because such exposure may inoculate against rather than sensitise to later risk. For example, research conducted with animals has shown that stress inoculation effects were achieved when young monkeys were separated from their mothers for brief periods. Their counterparts who were never separated from their mothers showed more stress and anxiety, suggesting that stressful experiences can be cognitively enriching under certain conditions. Arguably, a similar process also occurs during cognitive behaviour exposure therapies for stress-induced psychopathologies. Rather than avoiding or escaping from a stressor, intermittent and controlled exposure to it can enhance distress tolerance. Third, that resilience is partly heritable, and that protective processes operate through both environmental and genetic effects. For example, maltreated children are found to be less likely to develop antisocial behaviour if they have a particular genotype that confers high levels of the monoamine oxidase enzyme, and less likely to develop depression if they have a particular genotype that confers efficient transport of serotonin. Fourth, that a focus on studying resilience to risk should not distract from the fact that risk factors and adversities can overwhelm one's adaptive capacities, especially when they accumulate, which they frequently do. For example, child maltreatment tends to co-occur with other threats to children's development such as parental mental illness, parental substance abuse, poverty, inter-parental conflict, and community violence. The effects of risk factors may also depend on the developmental phase in which they occur. For example, excessive stress or deprivation at key early developmental phases can dramatically impact brain development but also lead to rigid and inappropriate patterns of response at later developmental phases. Understanding resilience therefore must presuppose a careful consideration of both the measurement of risk factors and the mechanisms of their effects. Fifth, that just as the effect of a risk factor can depend on developmental timing and be long-term, so too can that of a

protective factor. For example, research with rats has demonstrated the stress-buffering effects of high levels of maternal care (increased pup licking and grooming, and arched-back nursing) experimentally. Importantly, the effects of variations in the level of maternal care emerged over the first week of life and persisted into adulthood, but were also reversed with cross-fostering. Cross-fostering of infant rats from good to poor mothers and vice versa was able to alter the effects of early care experience.

Perhaps the most important recent development in the study of resilience, however, is the move from identifying protective factors and contexts to understanding how these protective factors and contexts exert their influence. Understanding the reasons for some individuals' positive outcomes despite risk is important for preventing and treating problems associated with that risk. This shift in focus on identifying the mechanisms of the effects of protective factors means that research on resilience is increasingly taking a longitudinal perspective; mechanisms must, by definition, follow the risk exposure. Also, resilience is not always immediately seen. Rather, protection may come long after the risk exposure, suggesting the value of taking a long-term or even life-span approach to studying resilience and the processes leading to it. A longitudinal perspective also allows the examination of the role of "turning points" or transitions in resilient functioning in response to early adversity. Important life transitions (such as to school, adolescence, adulthood) provide opportunities and challenges for individuals to remain on an adaptive trajectory, to "bounce back" from a decline in functioning, to persist on a maladaptive trajectory, or to exhibit a decline in functioning. In recent years, significant progress has also been made in understanding how the brain regulates reward and motivation, learns, remembers and responds to fear, and develops adaptive social behaviours. The neural mechanisms behind these functions are relevant to how an individual responds to stress and may account, at least in part, for the character traits that relate to resilience. Advances in stress neurobiology but also genomics, epigenetics, brain imaging and immunology will make important contributions to knowledge about the processes leading to resilience.

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See also: Adversity; Coping; Cumulative Advantage and Risk; Epigenetics; Gene-Environment Interplay; Risk and Protective Factors; Self-Regulation; Stress

Further Readings

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