

Rising from the Ashes: Exploring Resiliency Factors in Adolescents and Adults

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**Abstract**

An individual's capacity to be flexible and adaptable to external and internal stressors is vital for survival. Unemployment, illness, drug and alcohol exposure are examples of some of the many realities and normalized behaviors that exist in our society. For many, these perceived notions of inescapable realities manifest in the onset of later disorders such as depression and anxiety. However, there are examples of people who refuse to let their surroundings become the inevitable and rise above their cultural and personal boundaries. Resiliency is best defined as the capacity to spring back, rebound successfully in the face of adversity, and develop the capacity to feel control over an environment (Helton & Keller, 2010; Walsh, 2003). How individuals respond to traumatic and stressful events is seen in both psychological and biological literature. This literature review will identify how resiliency is expressed in human behavior through genetics, environmental protective factors and the dynamic interactions between them. Specifically, this literature review will consider biological explanations for resiliency, environmental and situational explanations, gender and geographical differences and limitations and future directions for research on resiliency.

## **Introduction**

The study of resiliency and how it is manifested, developed and expressed is critical to understanding how human beings are able to cope with and conquer adversity. Adolescents' and adults' ability to cope with stress in a positive and adaptive way is a strong predictor of prosperity. Exposure to drugs, poverty, illness and lifestyle stressors is a reality for many individuals in all cultures and locations. But, our ability to harness negative emotions that are associated with the stressors and setbacks we encounter in life allows us to not only carry on, but also thrive. Resiliency, arguably an imbedded trait, dynamic process or an interaction between both of these, allows individuals to avoid the development of psychopathology and western definitions of illness and maladaptive behavior.

Exploring resiliency factors in adolescents and adults is an up and coming topic of discussion in psychology research today. Little is known about the specific biological processes that account for resiliency in people, nor the environmental protective factors that contribute to the expression of it in human behavior. How does our body respond to stress in an adaptive manner, and how does stress affect gene expression? How do people that suffer from severe illness, poverty and drug exposure survive in an environment that many find hopeless and unchangeable? How do positive relationships, reciprocity and positive outlooks predict resiliency and one's ability to survive and flourish? How might cultural differences and understandings of stress and resiliency differ? These are all questions that are important and necessary to understanding the topic of resiliency in psychological literature. This literature review will attempt to capture the basic underlying social and neurological causes of resilience and its dynamic expression in humans.

**Biological explanations of resiliency**

Cellular resiliency is the ability of a cell to adapt to a stressor that accelerates the progression of diseases and aging (Puterman & Epel, 2011). Following a perceived stressor, the body releases catecholamines (epinephrine and norepinephrine) from the sympathetic nervous system. The hypothalamic- pituitary-adrenal (HPA) axis is also activated following stress by release of corticotropin releasing hormone (CRH) from the hypothalamus to the pituitary gland which releases adrenocorticotrophic hormone (ACTH) that activates the adrenal gland's release of glucocorticoids (Hunsberger et al., 2009; Sapolsky et al., 2000;). Problems arise when this system of chain reactions malfunctions and is unable to turn off, which can happen if the individual is chronically stressed. Decreases in glucocorticoid function are related to a diminished sensitivity to cortisol, which could inhibit an individual from reacting appropriately to danger. Dysfunctional glucocorticoid processes may also be related to deficits in heart beat rhythm and regulation, altered motivation and reward-seeking behavior and facial emotional labeling (Brotoman et al., 2008; Hunsberger et al., 2009). Neurologically, behavioral and cellular resistance can be achieved by enhancing glucocorticoid's negative feedback mechanisms or enhancing cell survival mechanisms (Hunsberger et al., 2009). An inability to turn off this stress response can cause anxiety and depressive behaviors as well as cognitive dysfunction.

Continuous stress may also affect telomere length, the DNA-based biomarker that indicates cellular age (Puterman & Epel, 2011). Telomere length captures the interplay between life experiences, genetics, and psychosocial and behavioral factors. It is suggested that individuals who exhibit resiliency phenotypically have longer telomere length and are less likely to experience shortening as a result from stressful situations. Longer telomere length is attributed to psychological stress resilience, healthy lifestyle factors, and social connections-

which can protect individuals from stress-induced telomere shortening. Puterman & Epel (2011) suggested that chronic stress effects on telomere length can be protected by individuals who have high levels of resiliency.

Learned helplessness and social defeat are triggered by exposure to stress. Animal models are useful research paradigms to examine how acute unavoidable stress (AUS) unmasks the development of vulnerability or resilience of an animal when faced with a negative experience. In a study conducted by Benatti et al. (2012), researchers wanted to test whether an opposite behavioral reactivity to stress in male rats can be attributed to different genetic profiles after exposure to AUS. Researchers had three groups of rats: one control group who received no stress, rats who exhibited resilience in the AUS condition and rats who were vulnerable in the AUS condition. All rats were put through thirty trials of an 'escape test' to investigate their ability to exit the test when exposed to an avoidable unpleasant shock. Rats who were not in the AUS condition escaped 20-30 times on average and rats that were exposed to the AUS condition had two separate reactions to the noxious shock. One group escaped fewer than eight times and the other group escaped more than 18 times. Rats who exhibited a resilient phenotype, characterized by the group who escaped more than 18 times, represented only 45% of the stressed animals. Additionally, researchers found that the frontal cortex of resilient rats had a downregulation of the transcript coding for the interferon- $\beta$  and leukemia inhibitory factor while vulnerable rats had an upregulation of neuroendocrine related genes, growth hormone and prolactin. In the hippocampus, the muscarinic M2 receptor was downregulated in vulnerable but upregulated in resilient rats. These results indicate that an exposure to a stressor triggers two different behaviors and effect gene expression differently in each. These observations can be applied to humans and illustrates how those who are unable to cope with stress succumb and

proceed to develop severe stress-related or induced disorders such as depression (Benatti et al., 2012; Claessens et al., 2011). Phenotypical expressions of stress-resilience or vulnerability may be driven by specific gene expressions as seen in both animals and humans.

In order to test for the potency genetics has on an individual's ability to express resiliency in the presence of stressors it is most useful to examine biological and environmental interactions. Studies on twins suggest that genetics largely influences an individual's resiliency. In a study by Hansson et al. (2008), researchers investigated the importance of genetic and environmental influences on resiliency factors on Swedish twins. This study included 326 twin pairs (150 monozygotic and 176 dizygotic) who are part of the Swedish twin registry. The experimenters focused on seven concepts that they found to be important for resiliency: sense of coherence, mastery, self-directedness, cooperativeness, self-worth, humor and optimism. Researchers also administered questionnaires that assessed depressive symptoms, quality of life, overall life satisfaction and global self-worth. Results indicated that both genetic and non-shared environmental influences are important for the manifestation of the seven resiliency concepts they tested for. But, monozygotic twins were more likely to express similar manifestations of the seven resiliency concepts than dizygotic twins. This suggests the degree of power and determinative role genetics plays in these similar manifestations.

Even when an individual lives in an aversive environment, genetics appears to overpower the detrimental influence environment has on an individual. Exposure to a high-risk environment where the abuse of drugs and alcohol is prevalent can create false perceptions of what constitutes normal behavior and social interactions within a specific environment. However, the ability to be resilient in these situations where engaging in risky behavior or failing to rise above is expected is seen in extraordinary cases of adolescents at risk for substance abuse. In a study by

Weiland et al. (2012), researchers examined adolescents' ability to disengage from normative-deviant behavior. The study examined neural responses during a working memory task that is related to impulsive behavior and substance use outcomes (Corral et al., 1999; Ozkaragoz et al., 1997; Weiland et al., 2012;). Specifically, researchers wanted to see how resiliency is related to the anterior attention system that involved the prefrontal cortices and projects to the basal ganglia and thalamus. Participants of this study were 43 men and 24 women between the ages of 18-22.3. They were recruited from the MLS of families with parental alcoholism and were contrasted with those who came from nonalcoholic families. Experimenters measured resiliency by observing the children during their early teen years. Brain scans using an fMRI machine were also taken while they performed a working memory task. Researchers found that resiliency in early adolescence were associated with later drinking behavior and less substance abuse as compared to their non-resilient peers. In addition, resiliency also correlated with faster reaction times during the working memory task. This research argues that individual genetic coding appears to be a stronger dictator of resiliency expression than environmental influences.

### **Overcoming traumatic experiences and high-risk environments through resiliency**

Although researchers interested in biological implications of resiliency would argue that genes are the strongest influence, many researchers would disagree. Others would argue that genes dictate predispositions and possibilities, but do not determine outcomes. One of the ways survivors of sexual assault attribute their ability to lead functional, satisfactory and vibrant lives is through their ability to seek connection and commonality through others who have exhibited resilience. In an article by Bogar and Hulse-Killacky (2006), researchers performed a qualitative study that interviewed 10 women who had been sexually abused as children. A common theme between survivors of assault or trauma was the importance of acceptance. Previous to testing,

researchers hypothesized and determined five possible clusters as resiliency determinants: interpersonally skilled, competent, high self-regard, spiritual, and helpful circumstances. And, hypothesized four clusters that would determine resiliency processes: coping strategies, refocusing and moving on, active healing and achieving closure. Researchers' hypotheses were proven true. Interviews from the study indicated that resiliency is both pre-determined by one's social environment, resources available and refocusing individual energy in an attempt to carry on.

The accumulation of protective factors determines resiliency from violent incidences of victimization. Attributes such as an individual's temperament, self-esteem, one's locus of control, and academic and cognitive skills promote resilience (Daigle et al., 2010; Heller, Larrieu, D'Imperio, & Borris, 1999). In a study by Daigle et al. (2010) data from the National Longitudinal Study of Adolescent Health, 90,000 students who completed self-report surveys at school in 1994-1995 were asked about their daily behaviors including drug use, delinquent involvement, and sexual behaviors. Participants who continued to be part of the longitudinal study were measured on their resiliency from victimization during three separate waves of data collection. Long-term resiliency was also assessed by identifying those who had not been victimized by the third collection set of data. The data indicated that an individual's probability of victimization was directly related to the number of risk factors he/she experienced. And, commitment to school, social support and verbal IQ all were protective factors for long-term resiliency. Thus, the accumulation of protective factors increased the probability of resiliency against victimization. Children who are committed to school may also be more resilient because they realize that higher education is an obtainable goal that provides ample opportunities. Through the social support of their peers they are able to escape their detrimental environment



where drug use and alcohol abuse is prevalent. Individuals who have a high verbal IQ are also more likely to be resilient because early introduction to reading and learning from a highly involved home environment or daycare allowed them to develop higher cognitive ability and goal-seeking behavior later in adolescence.

An important issue is whether resilience develops as a consequence of trauma (resilience as an outcome) or if resilience is a personality trait that can emerge with or without traumatic experiences. Philippe et al. (2011) proposed that ego-resiliency, or resiliency as a personality trait, can play an important mediating role in the relationship between childhood trauma experiences and psychological symptoms. To explore this question they administered 118 questionnaires to outpatients (82 females, 35 males) between 18 and 72 years of age at a psychology clinic measuring their level of childhood trauma, ego-resiliency, anxiety, depression and self-harm behaviors. Results revealed that ego-resiliency was a significant mediator in childhood trauma along with anxiety, depression, and self-harm behaviors. Thus, ego-resiliency may play a protective role for preventing the onset of psychopathology and detrimental disorders later in adulthood.

### **Gender and geographical differences in expressing resiliency**

Although resiliency can be thought of as a global personality trait or response to adversity, people from different genders and cultures manifest resiliency in very similar and different ways. For example, Appalachian women face many challenges throughout their lives. Many residents who live in rural Appalachia are exposed to lower income levels, higher levels of unemployment and higher infant mortality rates (Appalachian Regional Commission, 2007; Helton & Keller, 2010). Women are expected to conform to standard gender roles that center on domestic duties

that rarely allow them to be a significant financial contributor in the home. Interviews from a sample of ten Appalachian women conducted by Helton & Keller (2010) revealed that close kinship ties to Appalachian women's families and the large support they felt from their neighborhood-communities allowed these women to persevere through extreme exposure to poverty. Women felt an overall sense of empowerment knowing that they had support and reciprocal relationships with the women whom they lived next to. These Appalachian women also expressed the importance of humor, religion, humility and honesty as integral and vital aspects to continue their duties as a wife, mother and neighbor. This research illuminates the importance of feelings of connectedness, support and strong cultural values that seek to mitigate the daily stressors and hardships that are faced.

Cultures outside the United States exhibit similar tactics to achieve resiliency in the face of adversity. Similarly to the Appalachian women, women who have HIV/AIDS in rural Mexico point to their ability to rely on family for support and strength (Holtz et al., 2012). These Mexican women (20-48 years in age) were interviewed revealed that they overcame the social stigma and isolation of their illness through fear, anger, availability of support and resiliency. Both groups of women from this study along with the Appalachian women who were mentioned in the previous study specifically mentioned that they were resilient because of the presence of reciprocal emotional stability within their communities. The feeling of being needed appeared to be one of the reasons why these two groups of women were able to continue their daily routine. Other studies done with cross-cultural samples (Alessandri et al., 2012) comparing adolescents in the United States and Italy have found similar results indicating that those who were most resilient exhibited extraversion, openness and emotional stability.

Although there are shared cultural expressions of resiliency, there are gender differences that exist and that can be attributed to each gender's specific and vital protective factors. Differences in protective factors may be accredited to socialization and learned gender norms (Hartman et al., 2009). Hartman et al. (2009) used existing data from the National Longitudinal Survey of Youth to investigate whether males and females rely on the same or different protective factors to exhibit resiliency against deviant behavior and high-risk environments. Results indicated that resilient males scored higher than non-resilient males on self-perceived scholastic achievement. And, males were less likely to engage in drugs if they had high measures of religiosity and cognitive stimulation. Resilient females scored higher on measures of religiosity and positive school environment and were less likely to engage in drug activity if they had high measures of religiosity, positive school environment, self-perceived scholastic competence and self-perceived global self-worth as compared to non-resilient females. These results indicate that females' ability to exhibit resilience is through the accumulation of protective factors that are founded in social support and overall self-perceived competence. Females appear to need both support and advocacy from a larger social group while simultaneously needing deep-rooted self-confidence. The interaction and combination of two protective factors appears to be a significant difference between males and females and each gender's likelihood of expressing resilience in aversive environments.

### **Limitations of existing research and future studies**

Although research on resilience is relatively new, future studies may want to continue looking into the neurological, social and psychological reasons as to how we are born with or develop resiliency. Existing data is largely based upon answers received on questionnaires and from personal interviews. Although these two measures do not hold high statistical power, they

are still useful tools in evaluating personal accounts of perseverance and may still prove to be the most reliable and powerful way of evaluating resiliency. Studies that attempt to pinpoint biological reasons for why humans express resiliency is limited from studies that heavily rely on the implications observed from fMRI machines. Existing research is also limited because of the unknown effect of the researcher's gender on the participant's recall of personal resilience. It may be that participants who are telling examples of resiliency are more likely to elaborate and be honest with researchers who are the same sex as them. For instance, female participants in the presence of female researchers may be more likely to feel connected to women based on the unconscious idea that females share similar stories of hardship and need for emotional reciprocity. Additionally, the cross-cultural studies may conclude inaccurate similarities or differences between cultural manifestations of resiliency because of the difference in translation from administered questionnaires and loss of translation from participants' stories. Lastly, the research done thus far on resilience and resiliency factor determinants is superficial and needs to continue in order for us to understand that rising above adversity is not by mere chance, but perhaps is hardwired, developed, learned or supported through our genetic predispositions and surroundings. This research does not encompass everyone's story of individual resilience or explain other possibilities and paths that led to similar examples of perseverance and examples of the triumph of the human spirit.

Future studies may assess how individuals practice coping strategies that are examples of active or passive resistance, and that may differ from resiliency entirely. Future researchers also may investigate the role of individual's locus of control, intrinsic versus extrinsic motivation, and cultural definitions of empowerment in order to better understand how resiliency is conveyed. In order to conduct these implications for further research, both biological and

psychological studies may continue to better understand the role and interaction of genetics and environment.

Future studies may want to expand on the idea that exposure to mild stress increases your levels of resistance to stressors. Athletes who perform at a high level of competition and who have experienced serious injuries could be examined to explore this research extension. Athletes who have experienced career-ending injuries and still managed to compete later in their professional careers could split into a vial for convenient and cheap genetic testing and be compared to athletes who have not experienced career-ending injuries throughout their career. Comparisons between the two groups' DNA sequencing could be done to see if there are any visible differences between the genetic coding of resilient versus non-resilient athletes. In addition, researchers could also conduct interviews with these selected athletes and ask for personal stories of resilience and connect themes that are expressed by resilient athletes. This study could also be done with a non-athlete group to test if resilience is more likely to be manifested in those who experience repeated exposure to mild stressors and who have developed resistance because of it. With this experimental design biological, environmental, and exposure to continuous mild stress could be tested for and perhaps identify which factor is most determinative for developing individual resilience. This future research design would also have to consider athletes' relative levels of motivation, determination and hunger for success. Other research designs could also look at fMRI scans of athletes while completing a working memory task relative to non-athletes or athletes that have not experienced career-ending injuries.

Another future study may wish to examine how young children between the ages of 6-12 that have ADHD score on the self-report scale, ER89 which tests for ego-resiliency. Typically, children who suffer from ADHD not only suffer from academic deficits, but also have false

perceptions on their social connections with classmates and their level of competency. It would be interesting to see how scores on executive functioning tasks and on the ER89 compare for this population of children. Genetic testing could also be used on this population. Differences between genetic sequencing in ADHD children and those who do not have ADHD could be compared for any biological implications. These future researchers might also want to consider prenatal development of these children and the effects prematurity might also have on these results; since prematurity and ADHD are highly correlated. Future research may also wish to better understand and test for cultural differences in expressions of resiliency. Researchers should understand what emotions follow resiliency: whether this is individual empowerment or collective honor. Empowerment is arguably a very westernized value that is articulated after an individual conquers adversity versus the expression of honor in collectivist cultures and societies. Future research may wish to code for the emotions participants feel before resiliency, during resiliency and after to examine the idea of empowerment versus honor. Researchers can do this by either creating a standard questionnaire that can be translated easily or they could continue to collect personal interviews from participants. Although subjective narratives of participants may not be highly consistent for coders, it may still prove to be the best way researchers are able to bridge the gap in this research question. Universally, it may be that humans are resilient when they realize their own individual strength and potential to conquer adversity through the guidance of their existing and sustainable positive relationships. Empowerment may prove to be the most important indicator of the expression of resiliency in humans across all cultures.

## References

- Alessandri, G., Vecchione, M., Caprara, G., & Letzring, T. D. (2012). The Ego Resiliency Scale revised: A cross-cultural study in Italy, Spain, and the United States. *European Journal of Psychological Assessment, 28*, 139-146.
- Beaver, K. M., Mancini, C., DeLisi, M., & Vaughn, M. G. (2011). Resiliency to victimization: The role of genetic factors. *Journal of Interpersonal Violence, 26*(5), 874-898.
- Benatti, C., Valensisi, C., Bloom, J. M. C., Alboni, S., Montanari, C., Ferrari, F., Tagliafico, E., & Mendlewicz, J. (2012). Transcriptional profiles underlying vulnerability and resilience in rats exposed to an acute unavoidable stress. *Journal of Neuroscience Research, 90*, 2103-2115.
- Bogar, C. B., & Hulse-Killacky, D. (2006). Resiliency Determinants and Resiliency Processes Among Female Adult Survivors of Childhood Sexual Abuse. *Journal Of Counseling & Development, 84*, 318-327.
- Goel, K. S., Amatya, K., Jones, R. T., & Ollendick, T. H. (2013). Child and adolescent resiliency following a residential fire: The role of social support and ethnicity. *Journal of Child And Family Studies*.
- Hansson, K., Cederblad, M., Licdhtenstein, P., Reiss, D., Pedersen, N., Belederhiser, J., & Elthammar, O. (2008). Individual resiliency factors from a genetic perspective: Results from a twin study. *Family Process, 47*, 537-551.
- Hartman, J. L., Turner, M. G., Daigle, L. E., Exum, M., & Cullen, F. T. (2009). Exploring the gender differences in protective factors: Implications for understanding resiliency.

- International Journal of Offender Therapy and Comparative Criminology*, 53, 249-277.
- Helton, L. R., & Keller, S. M. (2010). Appalachian women: A study of resiliency assets and cultural values. *Journal of Social Service Research*, 36, 151-161.
- Holtz, C., Sowell, R., & Velasquez, G. (2012). Oaxacan women with HIV/AIDS: Resiliency in the face of poverty, stigma, and social isolation. *Women & Health*, 52, 517-535.
- Hunsberger, J. G., Austin, D. R., Chen, G., & Manji, H. K. (2009). Cellular mechanisms underlying affective resiliency: The role of glucocorticoid receptor- and mitochondrially-mediated plasticity. *Brain Research*, 76-84.
- Philippe, F. L., Laventure, S., Beaulieu-Pelletier, G., Lecours, S., & Lekes, N. (2011). Ego-resiliency as a mediator between childhood trauma and psychological symptoms. *Journal of Social and Clinical Psychology*, 30, 583-598.
- Puterman, E., & Epel, E. (2012). An intricate dance: Life experience, multisystem resiliency, and rate of telomere decline throughout the lifespan. *Social and Personality Psychology Compass*, 6, 807-825.
- Weiland, B. J., Nigg, J. T., Welsh, R. C., Yau, W. W., Zubieta, J., Zucker, R. A., & Heitzeg, M. M. (2012). Resiliency in adolescents at high risk for substance abuse: Flexible adaptation via subthalamic nucleus and linkage to drinking and drug use in early adulthood. *Alcoholism: Clinical And Experimental Research*, 36, 1355-1364.



