



Resilience

Why Things Bounce Back

by Andrew Zollli and Ann Marie Healy
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Take-Aways

- Resilience enables a system to bounce back from a crisis.
- Resilience is a complex quality found in systems as diverse as finance and ecology.
- Systems can remain robust when expected stresses hit. However, they are vulnerable to new attacks.
- Resilience exists in positive systems – like the body's immune system – and in negative ones – like terror networks. You can learn from both.
- Diversity increases resilience and is often found in “clusters,” like cities.
- Resilient systems work in networks and can cooperate or not as needed.
- Supportive communities produce resilient individuals.
- You can make yourself more resilient through practices such as meditation.
- “Translational leaders” work with existing hierarchies to increase communication and aligned function among all levels of a system.
- Resilient systems continually reinvent themselves in a flexible “adhocracy,” a social structure that allows constant change within a set of “fixed values and purposes.”

Rating (10 is best)

Overall	Applicability	Innovation	Style
8	7	8	7

Relevance

What You Will Learn

In this summary, you will learn: 1) How resilience manifests in individuals and systems, 2) Why it is increasingly important, and 3) How people and systems can become more resilient.

Recommendation

Innovation consultant Andrew Zolli and journalist Ann Marie Healy draw examples from widely diverse economic, natural and social systems to explain the nature of resilience, its significance and the factors that contribute to it. The concepts in this complex exposition apply to society today and will become increasingly relevant as world systems become progressively interconnected and stressed. Even though Zolli and Healy offer no easy answers, their treatise outlines ways to augment systemic resilience. *getAbstract* recommends this ambitious work to futurists, risk managers, crisis management planners and systems thinkers.

Summary

“Ever since the age of Darwin, scientists had been puzzling over one seemingly simple but impenetrable question: If living things evolved through competition, how did cooperation ever evolve?”

“Resilience is often found in having just the right amounts of these properties – being connected, but not too connected; being diverse, but not too diverse; being able to couple with other systems when it helps, but also being able to decouple from them when it hurts.”

The Significance of Resilience

Systems – economic, environmental, social – that people once treated as distinct from one another have become increasingly interwoven and interdependent. Disrupt one system and ripples spread through others. What makes complex systems act this way, and what can be done to make them function more safely? The solution is not more information. People have trouble making sense of the onslaught of data they already receive. Better predictions about when cataclysmic events might occur won’t necessarily lead to increased control. Instead, society must make its systems more adaptable and responsive. That requires understanding the emerging field of resilience.

Why do some systems fail while others rebound from similar events? Which characteristics make systems vulnerable to disruption, and which traits nourish resilience? Answering these questions, or even asking them clearly, is difficult. Discrete fields define resilience in different ways, but all of them acknowledge that resilience requires “continuity and recovery in the face of change,” particularly change imposed from an external source. Resilient systems use “tight feedback mechanisms” to tell when a sudden change is imminent.

Characteristics of Complex Systems

Complex systems are “robust-yet-fragile” (RYF), which means they are resilient when they encounter “anticipated dangers,” but they may be fragile in the face of “unanticipated threats.” For example, a tree farmer might plant trees sparsely on a plot of land to avoid risk; if one tree catches fire, the blaze won’t spread to others. Though robust, this system is inefficient since it reduces the arborist’s yield. If the farmer plants his trees densely, the farm becomes more efficient but more susceptible to the known risk of fire damage, and, thus, it becomes more fragile. The farmer could build a network of roads to limit a fire’s spread, but that would not halt a plague of beetles – an unanticipated threat – that attack his trees. The beetles could even exploit the road network, the farmer’s perceived safety mechanism, on their destructive path.

“If we cannot control the volatile tides of change, we can learn to build better boats.”

“From economics to ecosystems, virtually all resilient systems employ tight feedback mechanisms to determine when an abrupt change or critical threshold is nearing.”

“Translational leaders do not dispense with hierarchies; they recognize and respect their power.”

“Social resources are the oil that greases the wheels of well-functioning social networks.”

The Internet is an RYF system: It performs its original purpose well; that is, it allows distributed communications that are invulnerable to an outside military strike at one site or another. However, its networked openness makes it vulnerable to internal attacks. Developing one aspect of a system too far can push the entire system across a tipping point where once-positive characteristics become weaknesses and cause systemic collapse.

Resilience is found in positive systems, such as the immune system, and negative ones, such as terror networks. These systems use “sensing, scaling and swarming tactics” to increase their resilience. Such patterns let networks gather and transmit information in new ways, enabling them to respond to threats and opportunities. For example, when individual terrorists aren’t engaged in terrorism, they blend into their surrounding communities. By sharing their communities’ values, practices and personal connections, they remain invisible. Members of these networks monitor their surroundings and choose when to act, either to strike at their opponents or to recruit new members. When they act, rather than engage in extended campaigns, they swarm specific targets and disappear. The War on Terror is the first conflict in which nation-states are at war with networks. The US military had to adapt its tactics, organize in “nodes” and let teams choose when to respond, rather than waiting for direction from a hierarchical system.

Systems work as a “network of decentralized, self-coordinating parts” and organize in “clusters.” Clusters occur, for example, when high-tech innovators move to Silicon Valley to be with like-minded people, or when rural people move to cities. Cities are efficient. New thoughts, behaviors, art forms and styles move more quickly through cities than through rural areas. Cities’ increased density – of population in general and of people with shared interests in particular – affects resilient systems. Grouping people together in cities affects some significant societal factors. For example, income, violent crime, diversity, innovation and the speed with which people shift affiliations all increase. When widely varied people associate, they make systems more resilient.

To interact usefully, people must share trust and cooperation. These qualities are an evolutionary mystery: If competition drives evolution, where does cooperation fit in and how did it develop? Scholars draw answers to this question from fields as diverse as biology and game theory. Studies of human hormones indicate that the presence of oxytocin makes people biochemically predisposed to cooperate and trust strangers. Researchers use the basic Prisoner’s Dilemma game-theory scenario to test how individual actions shape cooperation. Imagine that you are one of two people arrested for a crime. Once arrested, you cannot communicate with your fellow accused criminal. If you both stay silent when questioned, you both get six-month sentences. If you confess and your cohort stays silent, you go free, but your friend gets a 10-year sentence, and vice versa. If you both talk, you both receive five-year sentences. What should you do?

Researcher Robert Axelrod held a Prisoner’s Dilemma tournament in which people proposed strategies expressed in computer code and played those strategies out against each other. The winning strategy, “Tit for Tat,” calls for assuming cooperation at the start but punishing each defection with a matching defection. “Tit for Two Tats” might be a better real-world strategy, since people are not perfect and could commit the first betrayal by accident. Individuals use different strategies, depending on their history with other players and on their cognitive biases. People are more likely to trust those from their “in-group” and to betray members of what they see as an “out-group.” To address trust in a society or economy, you need to find a way to show people they are part of a larger group, that is, to “enlarge their tribe.”

“If you live by a single curve – reaping the benefits of a single mode of wealth and capital creation – you can die an ignominious death by the same single curve.”

“Resilience isn’t just found in systems we admire but sometimes in systems we loathe.”

“Resilient cultures are rooted in diversity and difference and are tolerant of occasional dissent.”

“Resilience must continually be refreshed and recommitted to. Every effort at resilience buys us not certainty, but another day, another chance.”

Resilient Individuals

Individuals can be resilient. People can act in ways that increase their ability to bounce back after trauma. To learn more about how individuals can be resilient, talk to those who have undergone severe trauma, such as survivors of the Holocaust. In a study of adults who had spent part of their childhoods imprisoned in the Auschwitz concentration camp, psychologists found that some were intensely scarred while others had moderate depression and some formed functional personalities despite their suffering. Such resilience is a successful response to risk. Resilient individuals show “hardiness,” the ability to create a meaningful purpose for your life, the belief you can shape it as you wish, and the realization that you learn from both positive and negative experiences.

Examining how people deal with risk can be illuminating. In 1981, University of London geography professor John Adams coined the term “risk compensation” to explain how people in general handle risk. If a person’s risk drops in one area of his or her life, that person will compensate, knowingly or unknowingly, by increasing risk in other areas. For instance, folks who have automotive safety gear (like antilock brakes) drive faster and brake harder. Kids who wear helmets while playing take risks that kids with no helmets don’t take. Such risk compensation is a consistent, widespread act of reactive risk taking. It represents a larger tendency for systems to seek balance or “risk homeostasis.” In fact, everyone becomes “accustomed to some acceptable level of risk – or risk temperature.” Your body and your home’s thermostat maintain constant temperatures using feedback mechanisms to trigger actions to adjust the temperature as needed.

Personal resilience is associated with such characteristics as optimism and confidence. Traits like “ego-control” – how well you can “delay gratification” while striving for future goals – are “rooted in belief systems” that let you evaluate a situation and moderate your emotions. Some psychologists find that religious faith contributes to resilience and hardiness. You are likelier to bounce back from adversity if you belong to communities with supportive social networks.

Individuals can make themselves more resilient. Gaining control over your emotions reduces stress and improves how you respond to trauma. An established tool for this is “mindfulness meditation.” It stems, in part, from Eastern spiritual practices, especially Buddhism, but you can practice it in a secular fashion. Mindfulness meditation guides you through different ways of paying more attention to what’s going on in your mind and learning how to treat that activity with detachment and compassion.

“Translational Leaders”

The right leadership is essential in developing resilient social systems and organizations. These leaders do not steer from the top, like visionary CEOs or presidents. Nor do they guide from the grassroots. Instead, they use “middle-out” leadership to interact with all levels of an organization’s hierarchy. These translational leaders connect with a range of stakeholder groups and form a bridge between those in power and those who might go unheard. Translational leaders are embedded in a system and are always knowledgeable about how their system works.

Noah Idechong’s work in the Pacific island nation of Palau provides a good example. Various imperial powers claimed Palau over the centuries, but as long as they all neglected it, the islanders did fine. The fishermen knew the reefs and currents in their regional ecology, and their fishing practices followed communal customs that prevented overfishing. When outsiders introduced external technological and economic factors – like a market economy and mechanized boats that enabled overfishing – they disrupted

“As we expand the diversity of social connections we have, the bandwidth we can commit to each of those connections becomes more limited, and the information that comes across them gets weaker and narrower.”

“Instituting large-scale behavior change...is a complex and multifaceted undertaking, informed by a whole host of cultural norms, taboos, incentives, and mores.”

“All civilizations have their fragilities.”

the system. The island’s political integration into the larger modern legal system nullified traditional authority, leading local elders, who know their region’s systems intimately, to believe that no one listened to them anymore and that the system was failing. Idechong, a Palau native who studied in Hawaii, opened a dialogue among the parties, holding meetings in which local fishermen, who wanted to keep diving, could interact with environmental scientists. He translated traditional conservation activities into legislation.

CeaseFire

The staff of agencies set up to help residents overcome problems in troubled communities must develop local knowledge that is accurate and personal. Then they must continually update, re-evaluate and “recontextualize” what they’ve learned. Consider the activities of CeaseFire, a Chicago “violence prevention program” headed by Gary Slutkin who once worked with the World Health Organization in Africa. Drawing on that experience, he applied public health models to violence prevention. CeaseFire tries to interrupt the contagion of violence, as if it were a disease, by urging people who know individuals at risk – and who speak their language – to contact them directly.

Slutkin argues that “the Everything Myth” often blocks specific solutions. This myth contends that to address an infection, you must improve all aspects of patient life and care. For instance, to combat malaria, “you need to improve...the water, sanitation, nutrition” and more. In crime-ridden communities, that would mean addressing “education, poverty, parenting” and many more societal factors – an overwhelming demand. With CeaseFire, Slutkin rejected the Everything Myth and focused on producing a precise intervention to change behavior. CeaseFire zeroed in on violence prevention alone, ignoring other illegal activities. This helped people trust it more than they trusted the police.

After five years of extensive research, Slutkin and his staff boiled their program down to a few straightforward steps. Their research incorporated lessons from successful disease prevention projects. CeaseFire maintains “a good social map” of the shifting relationships among people. It tracks those who are vulnerable to violence and, thus, more likely to lash out. The organization works to change how people think by modeling nonviolence, providing social venues like barbecues, and teaching skills and concepts that help people to live without violence. Communicating the simple message that shooting people is not an option, and that – even when angry – people can choose alternatives, shapes new community norms and changes behavior.

Values and Purpose

A balance among an array of qualities produces resilience. Resilient systems are connected, “but not too connected.” They enjoy diversity, but not too much. They link with other systems when it benefits them but “decouple” when either system is at risk. Resilience requires “strategic looseness” – following strategic plans but shifting when needed. They try to build structures, but don’t let them become a trap so they can revise or abandon the attempts. A social structure that supports resilience is an “adhocracy.” that allows making and remaking structures and changing people’s actions within a constant framework of “fixedness of values and purpose.”

About the Authors

Andrew Zolli directs the global innovation network PopTech and was a National Geographic Society fellow. **Ann Marie Healy** is a journalist, playwright and screenwriter.