

# **Dynamic Interrelatedness in an Era of Disasters**

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## **Abstract**

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We are approaching initial tipping points in the climate crisis, which denote irreversible destabilization in climate patterns and extreme weather events. The pressing need is not only to shift from fossil fuels immediately but also to start focusing on how best people can cope with what is coming at us, which is likely to include further zoonotic viral pandemics. Surprising discoveries in human biology during the past twenty years – revealing that we are far more dynamically interrelated with other people, with nature, and internally than was supposed – are relevant to our situation. This article considers the societal implications and applications of these discoveries in three areas: health and effective healing, the social fabric of resilient communities, and effective education. When the new relational knowledge is incorporated, healing goes faster, health is boosted, infants' brains develop optimally, education instills resilience for the times ahead, and communities strengthen their social fabric, which brings many benefits. The challenge of relocating the millions of climate refugees who will be displaced within most countries is also considered.

**Keywords:** dynamic interrelatedness, climate crisis, resilience, Relational Shift, relational physiology, interpersonal dynamics in healthcare, nature and health, pandemics, ecopsychology, community emergency preparedness, evacuation centers, climate refugees, climate relocation, relational schools, consciousness

## **Introduction**

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What will the Earth be like in thirty or forty years? The winds have gone mad, pushed to catastrophic force as their air has become too warm, yielding stronger, wetter hurricanes, ramming storm tides into cities and coastal facilities containing toxic industrial waste, churning vast dust storms, driving wildfires at roaring speed for days on end, and forming funnel clouds on the plains that divide into multiple tornadoes. The ice shelves melt as the permafrost thaws and glacial snow disappears. The oceans warm and rise; the Gulf Stream weakens. The droughts spread and deepen, leaving desiccated lands and dry riverbeds. The heat-trapping greenhouse gases released into the atmosphere – mainly carbon dioxide, methane, and nitrous

oxide – will remain there, some for twenty years but many for more than a hundred years.

We have known since September 2022 that our planet, now more than 1.1 degrees C hotter than before the Industrial Revolution, has already entered the danger zone for approaching five initial tipping points in the irreversible destabilization of weather, winds, and climate caused by global overheating. Above an increase of 1.5 degrees C, which is the minimum expected, the tipping points likely to be passed include the collapse of the Greenland icecap (causing a significant rise in sea level); the collapse of a key ocean current in the north Atlantic (disrupting rain patterns for billions of people); and the abrupt thaw of the permafrost in the tundra (releasing vast amounts of methane and carbon dioxide). Passing the first five tipping points would trigger the second five; at an increase of 2 degrees C the remaining six tipping points would be passed. This was the conclusion of an analysis and synthesis of 200 studies of climatic tipping-point thresholds, published in *Science* magazine (Armstrong McKay, 2022). The research team determined that, having surpassed an increase of 1.0 degrees C, the planet may already have left a safe climate state. They emphasized the need to prevent the temperature increase from exceeding 1.5 degrees C. Yet it is now clear that we will fail to meet that goal because the industrialized countries are *increasing* the annual amount of greenhouse gases they put into the atmosphere, rather than making a concerted, all-out effort to build out a clean-energy economy, reduce emissions by 45 per cent by 2030, and achieve an extremely low level of emissions by 2050. Planetary heating is widely expected to reach at least 3 degrees C by the end of the century.

A reduction in greenhouse gas emissions in the 1990s of only 2 per cent would have headed off the catastrophe. Maddeningly, such efforts have been thwarted for the past thirty years by the fossil fuel industry, which relentlessly blocked domestic clean-energy legislation and any significant regulation of their business. Their lobbyists also repeatedly curtailed the language emerging from UN COP conferences on the climate crisis.

What then shall we do? *Of course*, we need to substantially reduce emissions and achieve a more rapid build-out of clean-energy, sustainable economies so that, at least, the increasing temperatures would plateau and the final group of climatic tipping points would not be reached. *Of course*, we need infrastructure repair and reinforcement, ameliorating projects that would counter the effects of extreme weather events, and housing for the millions of climate refugees who will be displaced within every country. *Of course*, we need to address the effects of neoliberal practices and policies that caused extreme economic inequality over the past forty years, moving money from working people (by withholding raises for decades, for instance) to corporate coffers and to the wealthy, leaving billions of working people without the resources they otherwise would have had to cope with

the climate emergency. Is restitution in order? In addition to those issues, though, we need to pay attention to the mental, emotional, and physical needs of *people* in the stressful times ahead. Here we catch a break. Discoveries in human biology during the past twenty years have changed the scientific understanding of human beings: we are far more dynamically interrelated with other people and with nature than the modern, mechanistic view of the human assumed. The new relational knowledge that has emerged is extremely relevant to our situation in the 2020s and beyond.

The escalating planetary crises – which include the possibility of nuclear war, economic instability, cyber attacks, ideological extremism, and failed states – are themselves interrelated. We do not know whether those areas of concern will intensify, but we do know that the climate emergency and zoonotic viral pandemics will. How shall we cope as persons and communities? Why should we soldier on while holding fast to tragically incorrect assumptions about how humans function and what we need? Even those who had dismissed warnings about the extremely disruptive nature of the climate crisis or other likely disasters received a wake-up call from the Covid-19 pandemic. The required periods of extensive seclusion, limited interactions, and lockdowns of public space chipped away at the security we had come to expect from modern life. We saw that a massive catastrophe – a virulent, mutating virus or any number of extreme weather events – could cancel much of what we took for granted. We found that severely reduced social contact unmoored our sense of being. It took a global pandemic for our advanced modern societies to realize that we need face-to-face human interactions to feel emotionally and mentally well, to feel securely grounded and *held* by the embeddedness of daily life.

## **The Relational Shift**

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If we knew ourselves to be so dynamically interrelated that even witnessing violence across a room as children damages the genetic material in our cells, that the growth of our brain and the development of our mind depended on the love we got as infants, that the robustness of our immune system was affected by whether we felt our parents loved us enough, that we heal faster, learn better, and feel more connected with others if we commune with nature, even through pictures – would we, could we, cherish and protect our extraordinarily *relational* nature of being? Would we think through the implications of these discoveries and realize that everything from the personal to the workplace and community to public policy needs to be reimagined and redesigned now to bring our ways of living in sync with our relational selves?

How could something so essential have come to seem marginal for so long? How is it that the biosocial needs of the human organism to connect with others barely registered? Alas, Western culture has been partially shaped for more than 2,000

years by a tragic misperception inherited from Greek philosophy: that there is a radical discontinuity between mind and body, between humans and nature, and between self and the world. Within these dualistic pairs, the mind is considered separate from the body and clearly superior to it, just as humans were believed to be superior to nature. After all, the mind was seen to direct the body.

When the modern worldview gradually emerged more than 300 years ago, additional elements were added to the Western frame of reference, some admirable, some regrettable. Since then, modern schooling and systems of knowledge have taught people to see the world, including ourselves, in a particular way – in fact, a peculiar way. Modern thinking is based historically on the mechanistic worldview, adopted from the Scientific Revolution. Its central revelation was that all physical reality is like a giant mechanism, like a clockwork. It is not – but to this day the premises and assumptions of that worldview maintain a strong grip on modern thinking.

Mechanisms of action can be observed in the physical world, of course, but they are embedded in a larger, more subtle context of dynamic interrelatedness. In the 20<sup>th</sup> century, first particle physics, later general systems theory, and then complexity studies in biology cast aside the mechanistic blinders and found that what we see as a universe or a forest or a tadpole is a domain of interrelatedness, continuously registering minute perturbations and changing conditions, manifesting creative responses unceasingly and unpredictably. But what of the human?

## **How Embodiment Works**

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Even as other areas of modern science began to accept a postmechanistic perspective and saw dynamic interrelatedness everywhere, the field of human physiology remained largely impervious. In fact, its mechanistic assumptions reached an extreme expression in the 1990s with the dominance of genetic reductionism, which held that *everything* about us, including our intelligence and our health, results from the bits of genetic material coded in our DNA, which was said to contain each person's structural blueprints and operating instructions. But then came a shock: the international Human Genome Project had to report in a press conference in 2003 that the human organism has considerably fewer genes than a tomato plant, around 23,000. The research quest to understand human complexity shifted immediately to studying the epigenome, the multitude of chemical compounds and proteins that modify the effect of genes by either suppressing a particular gene's function or allowing it to be expressed.

Once they looked beyond the mechanistic assumptions, the geneticists encountered relational reality: we are born with particular genes, but they are activated, or not,

throughout our lifetimes by epigenetic processes, which are acutely responsive to perturbations in and around us. They respond not only to physical privation, such as famines, but also to stressful relationships. The latter have been found to cause epigenetic processes to wind tightly around (or “mark”) particular genes, preventing them from activating. So while it is true that the human organism can be said to function through biomechanistic actions, those actions are driven by the dynamic interrelatedness that both constitutes and surrounds the bodymind.

Quietly, gradually, yet quite radically, the way modern physiology understands the nature of the human organism has shifted. Even before genetic extremism was refuted, some researchers had made surprisingly relational discoveries in physiology, a few of which were reported in the media. One morning I noticed a small article in the health section of a newspaper about the findings of study of elderly people: having friends was a far stronger protective factor for avoiding dementia than is doing mental calisthenics like crossword puzzles (Fratiglioni et al, 2000; Wang et al, 2002). Later I saw an article about a study that found that elderly people without friends and with few social contacts lost motor skills (such as walking, gripping, and balancing) faster than elderly people who have friends (Buchman et al, 2009). The researchers were surprised, the article noted, that anything as tangential as socializing could possibly affect the musculoskeletal system. But it does. I soon began to notice other articles reporting similar findings, from which I was able to look up the research studies online. A particularly heart-rending discovery resulted from a study conducted in London: if a child under age ten repeatedly experiences domestic violence – directly or even by witnessing it – the protective telomeres in his or her DNA become eroded (a condition usually seen in elderly people). The more types of violence experienced the faster the erosion (Shalev et al, 2012; Shalev et al, 2013). This genetic damage predisposes the child to health problems later in life and a shorter life expectancy (Morgan, 2021), although yoga has been found to lengthen telomeres in stressed adults. The common ground among these discoveries was never noted in the articles, though it seemed obvious to me: dynamic interrelatedness. I gathered many of the initial relational discoveries plus my ideas for their societal application in my book *Relational Reality* (Spretnak, 2011).

As the findings in physiology joined previous discoveries in complexity studies, nearly all areas in the field of biology were shaken up by the wave of evidence of interrelatedness. To clarify and advance this sea change, a consortium of prominent American science organizations released a report in 2009, *A New Biology for the 21st Century*, declaring that biology has entered a new era, moving from the reductionist “parts-list” study of living systems [for the past 300 years!] to an integrative Systems Biology. Only a systemic approach, the report asserts, will yield an “understanding of complex biological processes through dynamic interaction of components in living systems.” It concludes that the primary research focus has shifted to how humans and

other life forms function through complex interrelationships and networks of relationship (NASEM, 2009, introduction). Ah, much better.

Taken together, these discoveries in human physiology – and there are now thousands of them – have begun to displace the old projection of the body as a biomechanism, a self-contained, isolate organism composed of separate internal systems. Instead, the new findings reveal that we are unimaginably interactive at every instant. The human organism is structured by and functions according to dynamic interrelationships. Complex relationships within us, with other people, and with nature continuously affect our organ systems, our cells, and even the expression of our DNA, all of which are composed of interrelationships. The new knowledge emerging from these discoveries is sometimes called *relational*, meaning pertaining to relationships, because it recognizes the central importance of myriad subtle interrelationships, which were previously missed entirely or considered inconsequential. Because nothing lies outside of the vast fields of interrelationships manifesting the physical world, they are actually *intrare*relationships. They are called *dynamic* because they change, responding creatively to various perturbations. The quality of our relationships in the three areas – with other people, with nature, and internally – significantly affects our physical condition from the moment of our conception to our final breath.

Perhaps it can finally be widely understood that the supposedly isolate, thoroughly autonomous self, a central concept underlying much of modern Western thought, does not exist in this particular universe. Rather, each of us is physically a self-in-relationship. Any relationship that affects us – the warm sunlight on our arm, aggressive words from an angry person, or much more subtle interactions we do not even notice – creates effects in every direction, not only in us. The interrelationships influence one another, and they do so unceasingly. As for our individual existence, it is part of a vast field of relationships that both constitutes our bodymind and also surrounds us, extending throughout the rest of the natural world. Rather than being largely closed-off beings in a sac of skin who may, or may not, be in relationship with other beings, we exist in dynamic responsiveness at incredibly subtle levels. At every instant, we are *in play*, fully involved in myriad relationships, both tangible and intangible.

Knowing about the new discoveries allows us to see that a person's physical, mental, and emotional resilience is very much dependent on the quality and the functioning of countless interrelationships over time with other people, with nature, and within the bodymind. We are formed by and draw from the entire relational complex – during our gestation and formative period, in the interim years, and now. Both personal and societal resilience, which are increasingly on our minds during this era of planetary crises, have a physiological dimension: dynamic interrelatedness.

## Relational Wisdom for the Times That Are Coming

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The more we learn about the new relational findings in human physiology the more obvious it becomes that the way we customarily do many things in modern life is a poor fit with the way we are actually structured and actually function. No wonder the old assumptions led to widespread personal suffering, disease, and societal problems. As we face intensified extreme weather events and viral epidemics, we need to unburden ourselves of the constraining, inefficient, and anti-relational ways of doing things. We need to shift to what works.

Many of the recent findings in what can be called *relational physiology* are beginning to be put into practice in healthcare, education, and other areas. Why? Because revising or replacing conventional practices and procedures with attention to the quality of the relationships that are involved turns out to be both efficacious and cost-effective. *Our efforts on both the personal and the societal levels are simply more effective once we acknowledge and attend to the dynamic interrelatedness that infuses our every moment.*

If our societies do not take advantage of the new relational knowledge – by achieving what I call the Relational Shift in our thinking – we will be far weaker during emergencies and ongoing stressful times than necessary. In the past, broad-based societal remodeling that results from adopting new ideas and discoveries typically progressed gradually, but our situation today is gripped with urgency. Success will not come from any one source but from myriad people in all sectors of all countries both applying proven relational approaches and also creating additional ways the relational discoveries can be put into practice. We are called to take part in a massive redesign project that will benefit both personal lives and collective well-being.

Our sense of what can reasonably be expected in daily life now and in the future has been shaken by the Covid-19 pandemic and, in many locales, by the initial stages of destruction caused by the climate crisis. As physical conditions deteriorate in the coming decades – and/or as supply chains of food and other goods are further disrupted – a vast complex of psychological responses will emerge. No matter what they turn out to be, if we can increase awareness of the recent discoveries about our deeply relational nature, we will no longer be going against the grain when we strive to heal and to cultivate health, to weave the social fabric of community resilience and recovery, to educate children for the times ahead, and to think wisely about handling the massive relocation of climate evacuees from hard-hit regions. If we can incorporate the new relational knowledge into our institutions and governance, our communities, and our personal lives, the benefits will be immeasurable.

The cost of renewable-resource energy has fallen so dramatically that funding the transition to clean energy is much less expensive than myriad desperate efforts would be later on in a wildly escalating climate catastrophe. The same holds true for the Relational Shift: it is a crucial transition we need to make now. A starting point is awareness of the improved outcomes achieved by a relational approach in three areas: health and effective healing, the social fabric of resilient communities, and effective education.

## **The Relational Dimension of Health and Effective Healing**

The human organism evolved over two million years as our distant ancestors lived in small bands, clans, and groups, embedded in various kinds of relationships. The bodymind we have inherited from our forebears cannot function optimally without meaningful, face-to-face connections with other people. Yet the thrust of modern developments in recent decades has sidelined our biological needs, holding instead that “empowering the Autonomous Individual” via technological inventions is the triumphant way forward. The result? Today adults in the United States, for instance, have fewer close friends and social contacts than thirty years ago, as in-person social networks and connections continue to wane (McPherson et al, 2006; Allen, 2021). The effects on health are now amply demonstrated: feelings of isolation and a shrunken sphere of meaningful interactions, especially in people over 50 years of age, put them at risk for heart disease and stroke, dementia, and premature death (US NASEM, 2020). It is also finally understood by the medical profession that the metaphorical term *heartbreak* for the aftermath of a serious disappointment or rupture in a close friendship or love relationship, including the death of a loved one, has a literal meaning as well: a physiological hit to one’s cardiac health.

So the presence of friends and intimate partners – or the absence of friendliness – affects our health, but how? When we are speaking with a friend, we become biologically attuned to her or his voice, facial expressions, and physical presence. We perceive that person in a relational way, which increases our vagal tone, an indicator of the degree of activity of our vagus nerve, a long cranial nerve that interacts with the parasympathetic control of our heart and our digestive tract (Fredrickson, 2013; Porges, 2011). Those gut feelings! Ample vagal tone furthers the healthy regulation of our cardiovascular system, our glucose levels, and our immune system. Conversely, the lack of moments of attunement with others results in a sluggish vagal tone. We can even lose some of our biological capability to connect face-to-face if we do not do so regularly. Attention to the effect of vagal tone on health is merely one example of relational physiology today.



## ***Interpersonal Relationships in Effective Healthcare***

It is wrenching to think about all the people – my mother, my husband, my daughter, and various friends and relations among them – who at some point in their lives were seriously ill or ailing, injured or infected, and found themselves in a modern hospital, lying in a barren room with a window that often faced a wall at some distance. Each room was designed to suit a mechanistic ideal of peak efficiency but actually made recovery far more difficult than it should have been. The barren ambiance was matched by the detached, uncaring, and often brusque style of communication used by the doctors, and some nurses, a professional display that had been inculcated during their medical training to safeguard, they were told, proper standards of scientific medical practice by stiff-arming any distracting “emotional entanglement” (Hojat et al, 2009). As a result, the vulnerable and apprehensive patients found themselves under the control of people who did not seem to care much about them, and those who did – family and friends – were limited in their visiting to a two-hour window in the evening. Night and day, the patients’ grim ordeal was punctuated by startling noises and loud voices in the hallways.

This model prevailed from the post-World-War-II period until recently. It was partially the result of the macho self-image the professions cultivated after the war, but it also reflected the extreme confidence doctors had in the mechanistic view of the human body. The patient was viewed for the most part as a passive mass that presented a biomechanistic problem to be attacked with proper scientific rigor and distancing by medical experts. Yet it is now known, because of the recent discoveries in relational physiology, that every single element in the traditional model of hospitalization described above impairs good physical outcomes during surgery and impedes the healing process afterward.

If you have had cause to go into a hospital recently, however, you may have encountered a very different ambiance. In Scotland, the United States, and elsewhere, most new hospital buildings, as well as new wings, feature private rooms with a sofa-bed or a deep window seat with a thick cushion so that a loved one can sleep overnight. In this way, the stress of sharing a room with a stranger plus his or her visitors has been replaced by the emotional comfort of having a family member or friend at hand. When doctors and nurses enter the room to address the patient, the process is usually – but, alas, not always – conducted in a manner far more attuned to a patient’s plight in an understanding and supportive manner. What accounts for such a change?

The doctors have most likely taken a training session offered, or required, by their hospital in ways to achieve an empathic delivery of medical treatment. Why? With

“compassionate practice” (warm, caring concern and better information-sharing) surgical incisions and puncture biopsy wounds heal faster, and patients feel less pain and anxiety; they also have lower blood pressure and require shorter hospital stays (Riess, 2010). In the United States two meta-analyses of numerous studies of compassionate healthcare, were conducted in 2014: one by the Empathy and Relational Science Program at Massachusetts General Hospital in Boston, and one by the Center for Compassion and Altruism Research and Education (CCARE) Program at Stanford University School of Medicine in California, which features many research studies on their website. They found measurable, beneficial outcomes not only in post-surgical healing but also in blood pressure, blood sugar levels, and lipid levels in patients with various diseases (Kelly et al, 2014, re the MGH meta-analysis).

Compassionate care during office visits also results in better medical outcomes, as was found in a study that followed 242 doctors and 20,961 diabetes patients in Parma, Italy, during the year 2009. The doctors were first given a questionnaire based on the Jefferson Scale of Physician Empathy. At the end of the year the researchers discovered that the doctors’ empathy scores correlated strongly with whether each doctor’s patients with Type 1 or Type 2 diabetes mellitus had developed a greater or lesser number of acute metabolic diabetic complications. The difference was striking: the empathic doctors’ patients developed far fewer metabolic complications than did the patients of doctors with little empathy. The researchers concluded that “physician empathy” is an important skill in clinical competence (Del Canale, 2012; Hojat, 2016; Rakel, 2011, in which the Consultation and Relational Empathy [CARE] measurement was used). In the treatment of numerous types of illnesses and ailments, including problems with endocrine function, compassionate care increases the rate of healing and decreases the patient’s self-reported level of pain, resulting in substantial savings in healthcare costs, which has been labeled *Compassionomics* (Trzeciak and Mazzrelli, 2019).

### ***The Interrelationship of Nature with Our Health and Healing***

Another recent change in most hospitals is the switch to nature-based décor. You may have noticed nature motifs in the drapery and wall art. For instance, there might be a large photo of a mountain scene or a forest glen on the wall facing every patient’s bed. Nature videos with natural soundtracks are probably playing across from the patients’ chairs in the blood-draw laboratories and are also available as a channel in the television in each patient’s room. In the Magnetic Resonance Imaging (MRI) room, a blue sky with white, fluffy clouds may have been painted on the ceiling. In addition to flowing water features in the hallways, sounds of gurgling water and birdsong might be played during various scoping procedures, resulting in a significant drop in reported pain. In the newer hospital buildings all patients’ rooms

have a window facing trees or landscaping. Why have so many hospitals gone to the expense of installing nature-based décor and architectural features? The hospital administrators took note of the numerous studies, beginning in the 1980s, which have found that gazing at nature – even at a photograph of nature – reduces internal stress (and the secretion of cortisol), which aids our healing process and shortens hospital stays (Vincent et al, 2010; Van den Berg et al, 2015; Totaforti, 2018; Franklin, 2012; Elf et al, 2020).

But why would gazing at nature, or merely a depiction of it, ease stress reactions and help us heal? When we look at nature – or when we are in a room that includes wood and plants – physical responses are evoked in the trillions of cells within our bodies because of our long evolutionary history as organisms continuous with the rest of the natural world, immersed in its rhythms and energies (Jo, 2019). Nature’s birdsong, animal cries, and wind rushing through the treetops inspired the beginnings of our own meaningful sounds and the powers of language. Subtle variations of color and scent honed our senses. We shaped our lives to its diurnal rhythms and seasonal change. Eventually early humans created the first inklings of culture in response to the active dynamics of the unbroken continuity of being that was in and around them. They lived in small bands of matrilineal clans for some 180,000 years, then in agricultural settlements, then towns, then ancient cities, and even the megacities of today. Yet no matter how complex the subsequent social and cultural developments became, our bodyminds have never lost our constitutive dynamics: optimal functioning requires contact with the embedding webs of nature and personal relationships.

Numerous studies have found that spending time in nature reduces physiological stress reactions in brain activity, the cardiovascular system, the endocrine system, and immune function. Simply taking a walk through a cedar forest, for instance, which the Japanese call forest bathing, produces far more of those benefits than does walking for the same amount of time on a treadmill in an indoor laboratory (Haluza et al, 2014; Hansen et al, 2014). Not surprisingly, our bodymind in nature experiences significant benefits to our mental health as well, as researchers in the field of ecopsychology have discovered. For instance, the symptoms suffered by people with dementia or Alzheimer’s disease have been found to lessen when their bodily circadian rhythms are partially restored through exposure to sunlight or bright indoor lighting (Gao et al, 2018; Figueiro et al, 2014). We need physical and mental communion with the organic elements and dynamics around us because they are part of our biological kinship network. When we reconnect with the rest of the natural world, we become more fully alive and vital, right down to our cellular level. Perhaps this explains the healing effects of service dogs when brought into hospitals.

But why is it that some people are able to avoid the need for hospitalizations altogether?

### ***The Relational Development of a Resilient Bodymind***

The robustness of our immune system is not genetically determined at the moment of our conception. It is partially formed throughout childhood by love. This was the finding of a follow-up study to the Harvard Mastery of Stress survey, which asked a sampling of healthy, undergraduate Harvard students in the early 1950s about their relationship with their parents. The survey consisted of multiple-choice questions, some of which addressed perceptions of warmth and closeness with each parent. In addition, the boys were asked to rate each parent on characteristics such as “loving,” “just,” “fair.” The participants were asked whether they had a “warm relationship” with each parent. Perhaps most importantly, they were also asked, “Does your father love you enough?” and “Does your mother love you enough?” Thirty-five years later a researcher was able to track down 126 alumni who had participated in the original survey and who were willing to provide detailed medical and psychological histories, as well as medical records. Remarkably, of those men who had rated both their parents high in parental caring and love, only 25 per cent had developed a chronic disease in mid-life. Of those men who had rated both their parents low in parental caring and love, 87 per cent had developed a chronic disease by mid-life (Russek and Schwartz, 1997). The parents’ refusal, or inability, to love had literally compromised their son’s physical being.

Optimal development of the bodymind begins much earlier, first with gestation and then in the way an infant is brought into the world (Paul, 2011). Considering all the anxiety and stress most children experience today, surely we owe them a wisely relational mode of birthing to give them a good start in life. Many hospitals now bring the delivering woman into relationship with the medical birthing team by including her in the updates, deliberations, and decisions; this approach increases the odds that the process will go smoothly and results in fewer cesarean deliveries. If a woman goes through the birthing process with a doula (a birth coach at her side who encourages her and provides massage), physical benefits result: fewer cesarean deliveries, fewer forceps deliveries, less use of epidural injections of analgesia into the spine, fewer requests for other analgesia, and shorter labor time, as well as successful and sustained breastfeeding after the birth. Emotional benefits result as well, such as higher levels of maternal satisfaction with the birthing experience and better bonding between mothers and infants in the weeks and months after the birth (Ballen and Fulcher, 2006; Campbell et al, 2007). Once the baby is born, it is laid on the chest of the mother for an hour, skin to skin and covered with a blanket so that the familiar scents, heartbeat, and warmth comfort and reassure the newborn in its

strange new circumstances. Even when a birth must take place during an emergency situation in less than optimal circumstances, including as many of these relational elements as possible will greatly improve the chances for a good outcome for the mother and child.

Babies do not arrive ready-made. The physical development of their brain is still in process. During a child's first few years of life, more than one million new neural connections are formed every second. After that, the "pruning" of superfluous brain cells resculpts the brain over time. Relational factors in the toddler's life, it has been found, affect the resculping process and other structural aspects of brain growth, as well as the speed of information along neural pathways. Positive relational dynamics – especially the stimulus and deep communion an infant or young child experiences in a loving, intimate relationship with its mother or other loving caregiver – affect the child's entire bodymind, including the epigenome, which regulates the expression of all genes. The entire nervous system is affected in ways that reinforce emotional resilience and the capabilities for intelligence, as well as protecting normal developmental processes.

Another relational shift is the recognition that breastfeeding is far more than a mechanistic delivery system for neurosugars and other nutrients that stimulate mental and physical development. During the times spent nursing, the attachment between mother and child increases, as various types of verbal, nonverbal, emotional, and social learning are begun. It is here the baby finds its primary locus of *connection, security, and contentment* – the condition now understood to be key for optimal brain development, learning, healing, and resilience throughout our lifetime. The bonding that takes place during breastfeeding also stimulates growth of the infant's early-developing right hemisphere, which has deep connections into the limbic and autonomic nervous systems. Stimulating those deep feelings results in "the attachment relationship," the sense of being securely cared for and loved, or "attached," which then facilitates not only the growth of intelligence but also the expansion of children's coping capacities as they encounter and explore their environment (Schore, 2001; Siegel, 2001; Siegel, 2015; Palmer, 2009; Stamm, 2008). Once the infant's vision improves in the early weeks, the mother's emotionally expressive face is the major visual stimulus for metabolic changes that accompany rapid synapse formation in the baby's brain (Yamada et al, 1997). In addition, the physical and emotional connection that thrives during the hours spent breastfeeding (or bottle-feeding) supports maturation of the prefrontal cortex, which affects cognitive development and behavioral control (Feldman et al, 2014).

In short, love builds better brains. This was the conclusion of a study done in St. Louis in 2012. Maternal nurturance and support in the lives of infants, toddlers, and preschoolers was found to predict whether or not the hippocampal region of the

brain, which is key to memory and the modulating of stress, will develop in a healthy manner and to full volume by the time the child reaches school age (Luby et al, 2012). As the study's lead researcher put it, "We can now say with confidence that the psychosocial environment has a material impact on the way the human brain develops."

Detrimental relationships can actually cause permanent damage to a child's mental functioning and curtail the growth of portions of the brain. Recent studies, conducted cross-culturally, have found that beating or spanking a child slows mental development and lowers IQ and that the more a child is struck the greater the cognitive impairment. Moreover, the more cultural approval there is in a society for spanking or whipping children the lower the national average IQ score, even correcting for socioeconomic factors. This correlation was discovered in a longitudinal study of 17,404 university students in 32 nations (Straus and Paschall, 2009). It has also been found that the brains of young adults who had been spanked or hit frequently with implements such as straps or paddles showed structural damage, including a significant reduction in the amount of gray matter in the prefrontal cortex, which correlated with lower than normal IQ scores, and damage to certain neural pathways that convey specific neurotransmitters (Tomoda, 2009; Sheu et al, 2010).

At least, with regard to our immune system and overall health, even detrimental formative effects can be countered to a surprising degree by the extent to which we cultivate relationships as adults. We now know that people who have many friends and social contacts are four times less likely to catch colds or viruses than are people with few friends (Cohen, 2005); that people with strong social relationships have a 50 per cent greater chance of long-term survival (Brummet et al, 2001; Williams et al, 2009); and that volunteering regularly to help others improves health, longevity, and much more (Piliavin and Siegl, 2007; Yeung et al, 2018).

### ***Relational Modes of Mental Healthcare in Evacuation Centers***

Many of you will suddenly find at some point that you are climate evacuees. I did – in December 2017, as unusually strong, week-long winds off the Mojave Desert drove the Thomas Fire across 440 square miles of California, including the mountains surrounding the Ojai Valley where I live. As I looked out a window, I saw that a row of tall cypress trees was being pushed over by intense winds until they were bent parallel to the ground as the sky glowed red behind them. In that moment I was stunned to realize *Nature . . . looks . . . abnormal*. With only one of the four roads out of town still open, my husband and I were able to evacuate to the home of family members in Santa Barbara, as firefighters kept the flames from descending into our town, Ojai. Since then, I have a visceral reaction whenever I read about or

see footage of towns being threatened by extreme weather events.

At one point, when a huge cloud of black smoke settled over our neighborhood, I went briefly to the evacuation center set up in the high school gymnasium. I saw that most people there seemed stricken and depressed. Some people were seemingly traumatized. Those whose homes at the periphery of our town had burned and who had just lost everything alternated between grief and disbelief. In such circumstances, applying the new relational knowledge can ease the inner numbness or the mental agitation suffered by evacuees. Foremost, to reduce isolation and encourage interpersonal connecting, the cots in an evacuation center should be arranged not in a massive grid pattern but in quadrants or smaller sections that replicate the town's districts or neighborhoods. In this way, evacuees are likely to know some of the others in their section and will at least have something familiar in common with those around them. Each section of evacuees could choose a facilitator to further introductions and to be a conduit for information to and from the people in charge during the days ahead.

There is one more thing that might help with the group experience in an evacuation center arranged in this way: a daily council session. Let's say there might be some thirty people in a section, all displaced from one neighborhood or district of the town or city. They could divide into four age groups: youth, cultural (not necessarily biological) mothers, cultural (not necessarily biological) fathers, and wise elders. They could discuss topics such as "In hindsight, how well did the emergency services work and how might they be improved?" or "In what ways are we feeling the sudden loss that has occurred?" or "What would we like to see happen in our town in the aftermath of this disaster?" Each age group would discuss their perspective on the question and then report a summary of their conversation to the larger group. In addition to weaving relationships, this exercise allows participants to speak deeply from one's demographic vantage point on life, knowing that their own particular focus will be complemented by the perspectives of the other age groups. I learned this model in 1992 from an Okanagan elder, Jeannette Armstrong, and have found that such discussions result in a thoughtful and satisfying whole.

Equally important to social interactions is connecting with nature. It would be beneficial if the residents of the evacuation center could go outdoors a couple of times a day, especially in the morning. Weather permitting, and if the air quality is safe, they might take their meals on blankets spread on the grass, visit in small groups (with social distancing, if necessary), play musical instruments, or just enjoy the out-of-doors. Why? Because if we don't spend some time in sunlight we fail to produce substances that increase the level of natural opiate endorphins in the blood stream, which serve to ward off depression (Mead, 2008). Being outdoors as much as possible would provide an additional benefit as well: our sense of connectedness to

other people and the community increases after being in nature or even seeing photographs of nature. Inside the shelter it would be beneficial if large photos or posters of nature scenes were installed. If a movie was shown in the evening, it should be chosen partially for abundant shots of nature.

Why would such measures be effective? A series of four studies in 2009 found that among 370 participants those who were shown nature photographs projected on a screen and given a survey afterward ranked the importance of community, close relationships, and generosity more highly than did the groups who had been shown photographs of man-made sites, who ranked fame and wealth highest (Weinstein et al, 2009; Roan, 2009). The researchers concluded that the disruption of our links with nature may lessen our sense of connection with other people, which is particularly detrimental in an emergency situation. As numerous studies have found, connecting with nature brings out the best in us, our most vital self – just what we need in the wake of a catastrophe.

## **Weaving the Social Fabric of Community Resilience**

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How well are we coping in today's modernized societies? The long periods of Covid-19 seclusion, beginning in early 2020, demonstrated starkly to many adults that their social connections were fewer and more tenuous than they had realized. Many young adults feel distanced from others for a different reason: they report epidemic levels of social anxiety. Having focused much of their life online, they commonly experience face-to-face conversations even with friends as "awkward," and many find talking to a stranger on the telephone an unnerving ordeal. Worldwide, feelings of loneliness among young people increased sharply between 2012 and 2018 (doubling in Europe, Latin America, and the English-speaking countries and increasing by 50 per cent in East Asia), leaving them to feel alienated from others (Haidt and Twenge, 2021). Our tattered social fabric and the compromised capabilities of resilience leave most modernized societies ill equipped to deal well with the aftermath of catastrophic environmental events and the social disruption that follows.

There is an urgent need for every town to have a citywide system of emergency response in place and to be able to reach all residents: a well-planned system of Community Emergency Preparedness. I have been told by many people that there is no need for such a system in *their* town as the chance of a disaster is slight and far away. That assumption will change in the coming decades. Currently, however, the effort required to develop such a system is commonly deferred by local governments as too burdensome and by the public as too boring. A crucial reframing of this daunting task comes into focus when we view it through a relational lens. Why not regard Community Emergency Preparedness planning and projects as a convenient excuse to do something that is badly needed, quite apart from any future disasters?



Why not view Community Emergency Preparedness as a handy framework that would engage people in developing the needed repair and regeneration of our local social fabric? If the new relational knowledge is incorporated, emergency preparedness can be appreciated as an urgent impetus for reweaving and expanding the networks of connection that make a town vital and its residents feel well connected. As for the framework itself, excellent resources are available online from municipal, state, and national government agencies. These preparedness programs could be adapted and embellished to increase the relational richness of a town, particularly if a relational perspective informs the planning phases.

### ***The Municipal Community as an Organic System***

In addition to the goal of achieving preparedness, linking the energies and potentialities of a town, or a district within a city, enables it to unfold as a complex adaptive system, a term used in biological complexity science for a creative living system whose development and functioning cannot be predicted simply by identifying all its component parts, a system that is usually able to adapt to perturbations without losing function (Nelson et al, 2007; Satterthwaite, 2013). A town or a city neighborhood is composed of individuals and families, some of whom are already linked in organizations and networks or through casual acquaintance, such as being school parents. Once the existing links are connected in a comprehensive network, however, new interrelational and adaptive possibilities arise.

Since internet access and telephone service, for both landlines and mobile phones, may be unavailable after a disaster, a resilient face-to-face communication network should be established in advance, linking every resident in every neighborhood in the entire town or city. Initially, a message would be delivered in person from the municipality's emergency headquarters, which might be City Hall or a different location, to each of the District Heads, who would then deliver it with assistants to each of their Neighborhood Coordinators, who would deliver it with assistants to their Block Captains, who would then deliver it with assistants to every apartment and house on their block. Through a buddy system, young and middle-aged neighbors would check on the elderly. In each district, a Teen CERT (Community Emergency Response Team) composed of high school students, previously trained together, would assemble to be dispatched by the District Heads to carry out tasks as needed, such as setting up cots in an evacuation center.

Each of these levels would meet periodically during the year. Besides meetings of the District Coordinators with their Block Captains, there could be semi-annual block parties, district-wide or citywide fairs, and tours of well-developed backyard food gardens and permaculture designs. Existing organizations could be woven into the preparedness network by becoming responsible for particular emergency-response tasks. Communication, connections, and new friendships would abound – all while

advancing the odds of community survival and recovery. Introducing the concept of the *relational pension* might help to further civic participation in these projects: the interpersonal connections one cultivates prior to retirement will yield long-term health benefits and support later on.

Does it seem unrealistic that such Emergency Preparedness networks would be established? Many countries had similar systems, known as Civil Defense, in place during World War II. The populace cooperated because they realized that the potential danger was very real. Eventually, the public will realize that again with regard to the climate emergency. Why not get ahead of the panic?

As the climate crisis worsens and viral pandemics recur, every town and city is going to have to reconsider the way it provides mental health services. It is already apparent that the stress, fear, agitation, and depression accompanying the unraveling of weather and climate patterns – as well as the depression that often accompanies Long Covid symptoms – will swamp our current systems with their traditional model of individual, periodic sessions of psychotherapy. It is likely that mental healthcare entities will have to work creatively with community organizations and groups. One model of how this might be done is to share therapeutic knowledge through “task sharing,” a process by which peers, teachers, parents, clergy, health workers, and other nonspecialists provide mental health support to people, under the supervision of trained clinicians (Baker, 2021). Community-based mental healthcare providers of this sort, while only one part of the solution, would be well versed in the cultural orientations in various neighborhoods and well aware of the unequal ways in which the economic fall-out from the climate crisis affects various communities.

Hundreds of thousands of towns have already been struck by extreme weather events in recent years, often more than once. After a catastrophe, the atmosphere in a city or town can feel hollowed out. A sense of collective shock settles over the residents, whose inner balance has been rumbled by life-threatening forces. Everyone feels uncertain of what is possible. Among the brokenness and destruction, surely some things must be working as usual somewhere but how to know where?

When people venture out after an extreme weather event and see that some element of community life is up and running, they feel buoyed by relief, appreciation, and encouragement. The resilience of a town’s business sector, plus its nonprofit organizations and municipal government offices, is strengthened if they have incorporated some of the new relational knowledge well in advance of disasters. For instance, every workplace and organization has an organizational culture, and in recent years a shift from the traditional hierarchical, cogs-in-machine type of organizational structure to a more relational model has yielded beneficial results in many ways. Such workplaces are better able to respond as a team to the challenges of recovery – and they have become a place where people like to work. Two sources of

assistance in the relational transformation of local business sectors and non-profit organizations are the Relational Proximity framework and the Whole Systems Research program in Britain, as well as the Consortium for Research on Emotional Intelligence in Organizations in the United States.

A lesson from the initial shutdown during the Covid-19 pandemic was that every town or city needs to reduce its vulnerability by becoming less dependent on long-distance supply chains and distant corporate decisions. Having a more secure food supply usually requires supporting a greenbelt of nearby farms as well as farmers markets, community-supported agriculture (CSA programs), and direct purchasing from farms by lunchrooms in schools and other local institutions and businesses. Developing a diversified local source of food supply is one part of a larger relational approach called community-based economics: patronizing locally owned businesses to keep money circulating largely within the community and region; investing locally; import substituting; building up community wealth and spreading it broadly (through community land trusts, cooperatives, and profit-sharing); developing energy independence; and much more. This local and regional model has been developing for forty years in many countries. In Britain it was furthered by activists such as Helena Norberg-Hodge (Norberg-Hodge, 2019) and organizations like the New Economics Foundation. In the United States it was furthered by such activists as Michael H. Shuman (Shuman, 2015) and those at the Schumacher Center for a New Economics and the Institute for Local Self-Reliance.

A town optimally designed for well-being offers easy proximity to nature. The new relational research has found that creating and preserving parks, large and small, plus areas of greenery is essential. As for the assumption that greenery provides cover for criminals, recent studies have found the opposite: exposure to vegetal abundance is significantly associated with lower rates of assault, robbery, and burglary (but not theft), and it correlates with greater community cohesion (Weinstein et al, 2015; Wolfe and Mennis, 2012; Bratman et al., 2019; Robbins, 2020). Clearly, public policy must protect natural spaces as a way to protect public health.

Beyond the city limits, it would be wise to make connections with other towns in the watershed, or bioregion, because regional camaraderie and cohesion will serve us well in times of upheaval. Every human and other sentient being living in your watershed, whether they are tenth-generation or a recent arrival, is part of the watershed community.

### ***Relational Design for Climate Relocation***

In 2021 the World Bank issued an updated report, *Groundswell*, presenting the likelihood that climate change could force 216 million people across six world regions to move within their countries by 2050, with hotspots of internal climate migration emerging as early as 2030 (World Bank, 2021). How will societies cope

with this massive relocation of human lives within their borders? Ideally, we would already be seeing numerous efforts in planning and construction, involving all levels of government, nonprofit entities, and private companies. The logistics of mass evacuations and relocation would be a focus, as well as the problems of absorbing climate refugees into towns and cities (building new apartment and co-housing units on vacant lots, retrofitting the numerous commercial buildings left vacant as the economy contracts, and housing refugees in modest hotels). Because the existing towns and cities will not be able to absorb all the millions of climate refugees, adjacent refugee neighborhoods and freestanding towns will be needed, including the necessary infrastructure of hospitals, schools, stores, and police, as well as electricity from renewable sources and regional distribution grids.

As is already apparent from the foot-dragging on climate action, however, a nationally coordinated program of regional strategic planning and smooth execution of climate relocation carried out on a large scale for decades is not likely to happen. The forces working against such action include, in many countries, denial of the severity of the climate crisis; anti-government political ideology (opposing *any* government programs, let alone mandatory evacuations); resentment and even hatred of various groups of residents; and inadequate levels of public revenue at the local, state, and federal levels to pay for extensive resettlement projects (because of four decades of neoliberal tax cuts for corporations and the wealthy). In addition, such projects will be competing for funding with all the other climate-emergency situations that will demand immediate attention, such as infrastructure repairs after destructive storms or fires, public health epidemics caused by the insect-born viruses and bacteria moving north from the equatorial latitudes or released by the Arctic's melting permafrost, and disruption to the national food supply chains. Long-term public assistance will be needed. Clearly, Climate Emergency Funds should be inserted into government budgets at all levels and increased annually, funded through a restored schedule of progressive taxation.

We have already seen in recent years that in towns and cities where climate evacuees have sought refuge they are not always welcome after the first few weeks because of the homelessness they bring and the new demands their numbers place on public services. Ideally, numerous relocation suburbs and towns would need to be constructed, but even those, if feasible, will not be enough to house the millions of refugees from flooded coastal areas and other flood plains, wildfire and tornado corridors, drought-stricken farmlands, and areas often hit by catastrophic hurricanes and storms. Property insurance companies will pull out of those zones, which will subsequently be declared uninhabitable for physical reasons. Devastating weather events will repeat year after year. In towns located in relatively safe sites, desperate climate refugees will probably construct ever-expanding tent cities or shantytowns of scrap lumber or repurposed materials on vacant lots and parking lots. As the humanitarian crisis worsens, anyone with an empty room in a house or apartment

will be urged to take in a homeless climate-refugee family. At some point in the future that might be mandated by the government as the climate catastrophe continuously escalates.

What can the new relational knowledge offer in such situations? Not a solution to the physical dynamics of extreme weather events – although the entire crisis could have been avoided if the *relational connection* between the health of our planet's systems and that of humans had been recognized long ago by modernity and industrialism, both capitalist and communist. Nor can the new knowledge offer assurance that functional operations, rather than chaos, will prevail in all locales. What the relational discoveries can contribute to coping with the crises are the core findings about human beings, which can be incorporated into specific efforts worldwide, whether government-directed or created ad hoc by residents. Foremost, to preserve mental and physical health as much as possible, the climate refugees need to connect *with other people and with nature* every day. Whenever possible, any new or repurposed buildings should be daylighted, include common areas for gathering, offer views of the outdoors, and include numerous plants indoors.

As various versions of new towns and neighborhoods are created, whether they be the walled and turreted enclaves of the rich or the most meager shanty towns of those who have lost everything, the shelters and other buildings should not be laid out in the traditional grid pattern. Rather, multi-unit residential buildings, or tents, should be situated in a pattern of adjacent circles, each with a common area in the center, ideally with benches and tables. If there is an area of greenery, it should be considered a precious pocket park, with the structures positioned around it. Gently curving streets and walkways would deliver people to places where they might encounter others. Seen through the mechanistic lens, rejecting a grid layout is inefficient, but when the costs, disruption, and human suffering of widespread mental meltdowns among evacuees are factored in, the relational lay-out is the pragmatic option. Within every apartment building and every make-shift settlement, a communication network should be established that would include all residents. The guiding principle is simply to counter isolation through multiple modes of connecting. (In the United States, however, the fact that millions of guns will be carried by both climate evacuees and the unwelcoming residents of cities where they seek food and shelter adds a layer of horror to the probable scenarios.)

## **Educating Children Effectively for the Decades Ahead**

In only eighteen years the children born today will be young adults facing the climate emergency after many tipping points have been passed. Surely the infants and children among us deserve every developmental advantage made possible by the new relational discoveries to become as well-grounded, emotionally healthy, and resilient as possible. Although their initial cognitive and emotional development depends to a

significant degree on the relational experiences they have before school age, feelings of resilience can be cultivated throughout their formative years.

The umbilical cord blood of infants born in an industrialized country contains some 200 industrial chemicals and pollutants, which passed into them from their mother's body – from consumer-product ingredients (especially neurotoxins in plastics), pesticides, and wastes from burning coal, gasoline, and garbage (Environmental Working Group, 2005). Thus the increase in neurological disorders will most likely continue to rise. By middle school and secondary school, most children spend much of the school day, afternoon, and evening staring at a screen, whether a laptop computer or a smartphone. Situated in a perilous world of social media, they become increasingly insecure, self-focused, lone individuals. They frequently develop an inner frailty, characterized by feeling anxious, wary, and depressed. Their sphere of comfort and engagement is circumscribed by self-absorption born out of a felt need for protection. Many adolescents today interact with very few people and are fearful of speaking with people beyond their safe space. Even before smartphones, empathy levels – defined by researchers as responsive feelings of concern for others and/or the cognitive ability to imagine the felt experience of others – dropped 40 per cent in young adults in the United States, for instance, between 1979 and 2009, especially after 2000 (Konrath et al, 2011). Around the same time, other studies found a significant increase in narcissism (Twenge, 2013; Ballard, 2019). Empathy for, and even interest in, other people is in scarce supply.

What would happen in an emergency when these young adults suddenly find themselves clustered with a group of people they don't know in a situation of shock, uncertainty, and possible danger? The ability to relate to total strangers would be crucial, as would the ability to be part of the group cohesion and the ability to respond to others' distress with concern or at least attention. What our stressed-out young people will need is the resilience and interpersonal know-how that was taken for granted in previous generations.

This is their birthright, their bodymind's original, relational set-point of feeling connected with others. Studies at Yale University and at Ben-Gurion University in Israel in recent years discovered that babies as young as six to ten months of age express empathy (Hamlin, 2007; American Associates, 2019). Witnessing violation (such as one puppet-like figure pushing another off an incline) distressed them; seeing one character help another pleased them. One could say that the babies' judgments of good and bad, or right and wrong, are inherently relational. Interrelatedness is their reality: a profoundly physiological, loving relationship with their mother as well as the love of their father and other family members or caregivers (unless they have experienced emotional deprivation or violation early on). So how – and why – do our modern societies transform the innate moral engagement

of infants into the detached self-absorption of so many of our secondary school and college graduates?

Unlike babies born into many indigenous cultures, for instance, with a worldview based on the holistic perception of dynamic interrelatedness in all things, babies in Western(ized) cultures are soon fed into systems of modern schooling and socialization built on the Enlightenment fantasy that a (male) person is inherently a fully Autonomous Individual, existing apart from others and on top of nature. This premise is deeply embedded in our cultural DNA. The modern education system evolved to insert information and training into this separative individual. Mechanistic assumptions still dominate the curriculum, such as the belief that play among young children has nothing to do with cognitive development and is best discontinued at the kindergarten level (Strauss, 2014). Beginning around 2005, however, numerous studies have found that the quality of a young child's cognitive development is inherently linked with relational connections with people and with nature (Kohn, 2015). Play is the way young children develop their cognitive skills by engaging with color, sound, movement, and interpersonal experiences, including bodily movement. The cognitive skills they develop through play are grounded in a totality of interrelationships. They provide a solid, organic foundation on which symbolic learning can then be built.

Even before preschool, a crucial relational dynamic takes place: it has been found that *intelligence increases after birth* if an infant and young toddler is presented repeatedly with the gift of conversational language. The greater the number of words heard in conversation from birth to age three – spoken by the mother, father, or other primary caregiver and directed toward the child while making eye contact – the higher his or her IQ later on and the better the child does in school (Rosenberg, 2013; Quenqua, 2014).

### ***A Relational Curriculum***

It is the responsibility of the adults in a society to educate and guide the youth through their years of maturation, ushering them into the world. Our best hope for healing and avoiding the damage caused by the mechanistic worldview inherent in modernity, as well as the disengagement from nature and other people, is to place the new relational knowledge at the center of childrearing and education. The aim is to educate and develop the person-in-relationship. The curriculum, the institutional culture, and even the design of school buildings in this orientation incorporate relational findings about what children need to learn and develop optimally. A fruitful starting point is the influential Scandinavian and German model of outdoor preschools and kindergartens called Forest Schools, which has spread to many

countries in Europe and North America. At the end of the school year the children in these schools are above grade-level in the skills needed to be considered “learning-ready” because exploring and communing in nature has delighted them with the pleasure of discovery and knowing, entwined with the experience of executing creative ideas, overcoming difficulties, and acquiring relationship skills.

To posit a relational curriculum for kindergarten through secondary school, simply imagine the study of progressively complex understandings of the interrelatedness that constitutes the world we live in and the way it functions – rather than the usual modern curriculum that leaves graduates with the sense that the world is a bunch of disjointed, unrelated stuff and that they are just “random” players. Instead, young children would learn that letters, words, and numbers make sense because they exist in relationship to one another and to what they represent. Mathematics, science, history, language arts, and social studies, as well as physical education, are all about interrelatedness. The visual arts, too, express relationships, often with an associative resonance that exceeds the possibilities of words. As the children learn about their larger surroundings, they come to understand that they are embedded, along with everything else, in relationships that are always alive with creative responses to perturbations, whether microscopic or much larger.

Secondary school students would learn about the relational revolution that has rippled through many fields of knowledge since 2005. Biologists and physiologists, for instance, now find dynamic interrelatedness everywhere. Their relational discoveries have led to new areas of biology such as interpersonal neurobiology and social genomics, as well as the concept of the interactome in molecular biology (Narvaez, 2014). Similarly, the earlier focus of functional MRI imaging (fMRI) on various spots in the brain that become activated (“light up”) during various mental activities has given way to the relational focus on the interconnection of different areas of the brain, called functional connectivity (Gopnik, 2021).

All our organs and organ systems continuously respond to changes and activity in one another. They participate in one another. In nature’s design of the human organism, *Form and Function Follow Relationship!* From the synaptic pathways in our brain to our metabolic processes to the actions of our epigenome on the genes in our cells, nothing is static. Most microbiologists today view the 100 trillion microbes in the human body as a highly mutable ecosystem (Relman, 2012). Recognizing that the composition of the microbiota in our gut, like the composition of breast milk, changes many times per day, biologists now regard the concept known as homeostasis (the body’s recovery of an internal state of balance and stability after perturbations) as *dynamic* homeostasis. We are continuously *happening*. Graduates of a relational curriculum would grasp that everything emerges from and into endless fields of dynamic interrelatedness, the *intrarelated* totality. Nothing lies outside of it.



To explore and ponder the complexity of all those interconnections in and around us is a lifelong delight – one to be pursued with epistemic modesty since all knowledge is partial knowledge.

## ***A Relational Pedagogy***

A central message to students in a relational orientation is *Develop Yourself!* – with the understanding that a self is a person-in-relationship, not a supposedly isolate individual. In 2015 a study found that several measures of success in the adult world correlate with whether the person had cared about others and had developed good relationship skills in kindergarten. A young child’s ability to manage his or her emotions and to have good relational skills was found to be more predictive of future academic success than are academic skills. Researchers at Pennsylvania State University and Duke University in the United States followed 753 students in four locations. They found that those kindergarteners who scored high (according to their teacher’s assessment) on the Social Competence Scale were far more likely at age 25 to have a college degree and a job – and to have no arrest record or addiction to drugs or alcohol – than were those students who had scored poorly in social skills and caring about others (Jones et al, 2015). So an educational approach that actually serves children well would encourage them to cultivate relational skills early on.

Several studies also show the importance of touch in child development (Ardiel and Rankin, 2010). A program that began in Sweden, called Peaceful Touch, teaches kindergarten children to do simple massage on each other’s back, arms, and head (while fully clothed) after asking if a child wants to be massaged. Because nurturing touch for children elicits the release of oxytocin, their feelings of calmness and empathy are then increased, as is their ability to focus and concentrate. Massage periods are often scheduled to good effect before a lesson. Nearly all the kindergartens in Sweden use this technique, which has spread to Britain and other countries. When they reach fourth grade or so, students can also learn mindfulness techniques to settle their minds whenever disturbances and agitation occur.

In the higher grades of elementary school, two clusters of relational approaches have proven highly effective and are widely used in schools in North America. The first is *resilience-building programs*, which teach students how to bounce back from adversity and set-backs by tapping their unrealized sources of character, strength, and emotional intelligence – and how to cultivate a relational support network around them. Students in these programs learn optimism, flexibility, problem-solving, and motivation (Vance, 2021; Condly, 2006). The second cluster, *social and emotional learning*, teaches students how to develop five types of competence: self-awareness, self-management, responsible decision-making, relationship skills, and social awareness (Durlak et al, 2016). For the post-secondary level, a program in

Resilience-informed Skills Education (RISE) at Pepperdine University in California has proven fruitful.

The key to the learning process, as every great teacher knows, is *the quality of the relationship* between teacher and student. A bountiful resource for this subject is the Relational Schools Foundation in England, which offers many resources on their website about relational teaching and “relational proximity” in schools. However, a new problem in classrooms is that many children, primarily boys, returning from home seclusion during the Covid-19 pandemic find it difficult to interact with others, and they act aggressively toward students and teachers. No matter what the cause, violence in the classroom, discord throughout the school, lackluster efforts to learn, bullying, depression, and substance abuse are problems likely to increase in frequency as the stress of the climate crisis and pandemics continues. Fortunately, these conditions have responded well to various relational approaches.

Just as we heal faster when viewing nature, we also learn better when we have some connection with the natural world. This is our evolutionary imperative: a child’s optimal development will not occur if his or her relationship with nature is largely severed. Because numerous recent studies have found that students’ academic performance benefits from visual engagement with the natural world, relational schools ideally feature daylighted rooms, abundant plantings in schoolyards and environs, and large windows facing them. Urban schools can have plants in every classroom near the windows. Numerous studies and practical guidance are available at the Green Schoolyards Resource Hub on the Children & Nature Network’s website.

## **All That Is In and Around Us**

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What’s really going on with *dynamic interrelatedness*? How does it actually work? We are so accustomed to mechanistic ways of thinking that most biologists still speak of the “transfer of information” from cell to cell, from organ to organ, from person to person – but does that describe relational reality accurately? Isn’t the more relevant model those two photons spinning in a correlated direction in the famous experiment in physics proving Bell’s Theorem: even though the photons are sent in opposite directions leaving a great distance between them, the direction of their spin is always in sync, and if one changes direction the other instantly has done the same. This indicates that causality is not limited to, and is not primarily, a matter of local forces acting on one another. Our universe – like our planet and our bodymind – is composed of vast fields of dynamic intrarelatedness, but how it all functions is not understood by physics or biology. Agency is unimaginably more complex than we can grasp. Is there some sort of subtle field consciousness, far different from the human type, which extends indefinitely by which we function and in which we

participate? Some sort of dynamic field of all universe life?

We might know the answers to these questions by now had not modern Western culture marched so decisively in the opposite direction from older cultures that found the interrelated, gestalt nature of the physical world to be obvious, cultures that were and are guardians of the same relational wisdom modern biology has recently (re)discovered. Instead, for 2500 years the West has embraced the fallacy of discrete boundaries around the mind, the self, and the human species. With the emergence of modernity, the drift toward a relentlessly hyped techno-utopia existing triumphantly on top of nature felt inexorable because we had no countervailing base of knowledge by which to judge the new developments. Now we do.

As a cofounder of the field of ecopsychology, Theodore Roszak, observed in his book *Person/Planet*, “The needs of the person and the needs of the planet have become one” (Roszak, 1978: xix). In the thirty-five years since he wrote that, the condition of both parties has become acute.

### ***The Relationally Aware Activist***

How might we cultivate greater awareness that our bodymind’s powers of perception are far more extensive, multivalent, and complex than what fits within the limited frame of reference allowed by the mechanistic worldview? At any given moment, our conscious and unconscious awareness simultaneously perceives myriad qualities of the air pressure, humidity, temperature, and light – as well as the qualities of presence in the people and the animals we encounter, the shifting dynamics within a group, the precognitive apprehension of subtle events, and the inner flashes of memory and insight that are sparked by all we have known and all we have been. We register, too, the pull of the moon’s rhythms and the gravitational embrace holding the entire universe. All that and much more come together at every nanosecond to shape our next moment of consciousness.

We function from moment to moment through dynamic intrarelatedness so minute, so complex, and so encompassing that our conscious minds are aware of only a fraction of it – and those fleeting comprehensions may feel jarringly incongruous with the mechanistic framework of modern life. Because we are unaccustomed to perceiving and thinking relationally, it is difficult for us as a culture to grasp the ramifications of the physiological discoveries of dynamic interrelatedness, let alone the deeper understanding of it as *intrarelatedness*. Even when we read about the surprising findings, they hover off to the side somewhere as quirky anomalies with nowhere to alight.

Yet the fact that we are interrelational organisms means that every one of us can develop relational habits of perception and then deepen them. This can occur organically through time spent in nature. When we sharpen our ability to notice both the specificity and the interplay of sights, colors, forms, scents, and sounds in the incomparable displays of the natural world – in a backyard garden or a park or a wilderness preserve – we are acquiring skills that also help us to really hear, notice, and be fully present. Spending some time with the arts can also help us to develop a gestalt sense of reality that exceeds words. As the ceramics artist M. C. Richards put it in her influential book *Centering*, “How grateful we must be to art as it helps us to grow to the size of our reality” (Richards, 1989: 63). Time spent practicing mindfulness meditation also instills quiet attentiveness that carries over to perceptive awareness of the world and its lively mesh of interrelationships.

Seen through a relational lens, working in groups involves our sense of the quality of knowledge. In any sort of meeting, for instance, is the “smartest person in the room” really the one who has marshaled all the relevant facts and delineated a plan of action – or is it the people who are capable and knowledgeable but also have an astute and encompassing awareness of the dynamic interrelatedness in play in the room and among the past and present relational elements of the subject at hand? Trying to comprehend the entire gestalt, as well as bringing to bear well-focused attention, is a skill set that enriches a group’s effectiveness.

In community meetings to develop an Emergency Preparedness network or other projects, remember, too, that many of the adolescents and young adults might be pushing themselves beyond their comfort zone to participate in a gathering of strangers. Perhaps you might make an effort to welcome them, learn their names, and introduce them to other people with whom they might like to work. This is how growth and healing occur, slowly, bit by bit, through human warmth and kindness, replicated in millions of situations every day.

As we move further into the era of disasters, it is clear that the old definition of societal resilience as bouncing back to the status quo after a disturbance no longer serves us well. So many situations cry out for improvement and would benefit from a collective Relational Shift in thinking. If we determine ways to align our practices with relational reality – from personal habits to cultural protocols to public policy – we will be supporting the capabilities and needs of our bodymind instead of thwarting them.

Many of us will continue trying to achieve more sustainable, just, resilient, and ecologically wise communities and nations; others will oppose such a trajectory. Everyone on Earth, though, is heading straight into the escalating climate emergency and further epidemics. Through it all, we will be interacting with other people, no matter how stressed, frightened, or traumatized we and they might be. Remember

that every person you encounter is a wonder of interrelationships and creative possibilities. Remember that a kind word from you during these stressful times will instantly fill the other person's being, as it is perceived all the way down to the cellular level and ripples out through subtly vibrating fields of interrelatedness. Remember that a harsh word will do the same. To interact is to *intraact*, so let us do it with quiet joy, fascination, and appreciation – now that we know.

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