

TANGLED SYNAPSES

HOW NEUROSCIENCE AND RESILIENCE OVERCOME DEPRESSION.

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INTRODUCTION

“...The individual is an apprentice and pain is its master. Nobody knows himself until he has suffered...” Alfredo de Musset

“The impaired, distorted ‘reality’ I am accustomed to experiencing just showed up. As has been its habit over the last six years my depression episode has taken on a life of its own. It usually lasts for about two or three hours during which feelings of powerlessness, a sense of discomfort and unreality take over- as if I am not here, yet nowhere- but wanting to be somewhere. Such confusion dominates the mind. A feeling that you do not exist as a human being; yet you breathe. You look but you do not see, you do not want to be but you are. You try desperately to feel in the present but it is as if you are leaving the scene of life, you are being taken away from reality, indeed from the world. Of course, you hate it you really hate these feelings. A lot of thoughts and emotions come to mind. The most fervent one is that this torture ends right here, right now. But it does not. Time, then becomes your master. You feel that time never passes. Seconds, minutes, hours, and days become eternal. Agony, yes, agony is the best word to describe this. You give up on yourself, you give up on life, you care about nothing and you doubt anyone cares about you...”

The above body and mental states were my constant companion for many years. They became my “livelihood” until it was time to turn things around. I was not willing to continuing wasting my life away to a relentless disorder: *depression*.

After years of enduring a collection of mental disorders, understanding their neurobiology and making dramatic lifestyle changes, I found the secret to beat them. Hidden in the core concept that we are “biological machines with consciousness” is the truth that we are made to perish. We are made of cells and cells have a life span, so do we. We all want this biological machine with consciousness to last forever in the healthiest and most balanced mental and physical conditions. This is a tall order indeed. Disease, illness, and decay begin at the cellular level. Cell function and cell processes are so numerous and so complex that they are as important to mankind as air is to lungs. Cellular processes feed on each other. Happiness, *true happiness* is the absence of disease, suffering, or degeneration.

Mankind’s fate is to be happy however culture defines happiness. Happiness is what mankind vehemently pursues; yet it remains elusive. Happiness during the Roman Empire meant 6 months of circus in the coliseum’s arena to keep the people distracted therefore free from revolt. Happiness is intended to keep society in sync with cultural developments, thus making possible the further growth of society. Today happiness depends heavily on the fulfillment of the “American Dream.” Movies, television, and the media set an impossible standard of “success” yet we line up and to pay to see it. However, illness, lack of food and shelter and emotional shortcomings defy happiness at its very core. Eventually disorders like depression skyrocket as a result of failure to fulfill physical and emotional needs.

It is mesmerizing, amazing and surprising to realize that happiness, the core of human existence, is nothing more than a simple biochemical process. In actuality is not that simple otherwise we would be swimming in happiness all day long or maybe not.

Happiness is a biochemical process based on the secretion of the “right” amounts of minerals (electrolytes) such as Sodium, (Na), Potassium (K), Calcium, (Ca), Chloride, (Cl) and Water (H₂O) among others. The “right” secretions of these elements make brain cells communication known as “synapses” possible. When these synapses become “tangled” emotional disturbances ensue. Neuroscience along with common sense and resilience provides clues to “untangling” the offending neurons.

The longed result is a “*zero state*” an instant of complete and total ‘rest’ with “zero” mental processes and “zero” physical functions represented in optimal body and mental states, phenomena well explained throughout this book. At the core of this process lie meditation, exercise and healthy lifestyles. Maintaining the three daily life cycles, rest/activity, sleep/wake, and diet /metabolism in balance creates a healthy lifestyle drawing elusive happiness into reality.

According to calculations by the National Institute of Mental Health (NIMH) close to half of the US population will develop a psychological disorder at some point in life. ‘Psychological disorder’ is a broad term describing a wide spectrum of brain chemistry dysfunction (from minor to severe). This suggests a vast number of people will experience potentially devastating mental disorders. *Depression* is the most well known among these disorders.

This book is a recollection of events that began after I lost the desire to live. Through the suffering, suicide attempts, therapies, and disappointments-- hope of recovering my zest for life-- my desire to get my life back drove me to research neuroscience, the science in charge of studying how brain cells (neurons) communicate with each other, a phenomena called *synapses*, that when *tangled*, produce mental disorders. Human resilience buried deep within our core enables us to rise from the ashes like the Ave Phoenix.

I focus on mental diseases or brain disorders because this was my brand of burden to bear. Mental disorders are behavioral disorders that result from dysfunctional brain chemistry. Dysfunctional brain chemistry results when brain cells fail to do their job, affecting one or several brain systems. Among them cellular signaling systems, first messengers systems (serotonin, dopamine, norepinephrine, GABA, glutamate, etc.), second messenger systems, neuropeptides, the prefrontal cortex, thalamus, LAPH axis, hypothalamus, nucleus accumbens, amygdala, hippocampus, pineal gland, insula, the vagus nerve, the thymus, RCBF(regional cerebral blood flow), BDNF(blood derivate neurotrophic factor), glucose metabolism, DHEA, the CREB cycle, etc., etc.)

To get the upper hand over my symptoms I applied good management practices and skills from my professional career. I once believed illness was the exclusive domain of doctors and hospitals. In my experience getting sick meant going to the doctor or hospital, taking the prescribed medications or procedures then returning home to continue life as usual.

What I discovered revealed that while medicine offers important healing potential, in truth we are responsible for steering our own behavior, guiding our own brains to overcome any dysfunctional environment we face; or at least to manage our environment responsibly and not be a ‘victim’ of circumstances.

Tangled synapses resulting from brain chemistry dysfunctionality is rooted in two potential sources: *genetic predisposition to develop the disorders and a faulty interaction with the individual’s internal and external environments, represented in human behavior and*

neurobiological malfunction. While there are two types of behaviors; intentional or unintentional, the number of potential neurobiological mishaps is almost limitless.

I mostly focus on issues of human behavior, although genetics play an important role in illness development. An individual has little control over such things one way or the other, although nutrition, environment, and lifestyles affect neurobiology and brain function. Human behavior intentional or unintentional can inspire the development of brain malfunctions that could develop into mental disorders such as depression, anxiety, stress, panic, phobias, addictions, or weight disorders, etc.

This creates the old 'chicken and egg' conundrum. Does human behavior causes dysfunctional brain chemistry or do failed neural synapses could cause mental disorders that result in destructive behavior? A negative action or a destructive thought can create an imbalance in brain synapses. Or a neural under secretion or over secretion of sodium, potassium, chloride, or calcium can cause neuronal "glitches" that show up in behavior. Suddenly a vicious cycle of dysfunctionality develops. In this case the environment instead of offering protection leaves the individual vulnerable to habituating this vicious circle. Once there the individual is riding a mental rolling coaster.

The brain, behavior and the environment interact and depend on each other. In positive relationships behavior, brain chemistry, and environment can nurture and protect each other from misfortune. Likewise in negative environments, mental illness is nurtured.

Because we have little idea how these factors work together, we are ill equipped with the resources, knowledge, or tools to make good decisions. Worst case scenario people just give up caring about themselves let alone developing the skills and desire to truly care for someone else. An alcoholic will mess his brain chemistry beyond recognition, as will a compulsive eater, or gambler. The addiction may be a dysfunction in his genes. So healing and prevention from developing these devastating illnesses becomes a matter of learning and mastering the interaction between brain, behavior and the environment. A basic knowledge and understanding on how the brain functions could keep the "wrong" genes away from the "wrong" behavior.

This book intends to demonstrate that we as individuals have the responsibility to take care of our own behavior, and to overcome our dysfunctional environments. Or at least to make sure we control our environments and not the other way around. I decided to make my experience public in an effort to reach out to millions of others who have or may suffer from the same disorders I face. This account may be useful not only to those who walk the thorny path of solving ordeals like mine. It also may prevent others from developing such imbalances in the first place. I hope my experience help those desperately searching for relief from these life shattering disorders.

I can see that only a small percentage of people live a *wonderful life*, those who had managed to fully control their environments. Maybe that is why we are so obsessed following the life of the privileged. The rest of us live 'as is.' Some struggle constantly to keep up, hold on, and to survive. These people will never be happy because they do not govern their environments, their brains, or their behavior effectively. How else can there be 25 million or more depressed Americans and 500 million depressed people worldwide?

I know someone who suffers from severe migraines. I explained to her the basic behavioral, environmental, and biological factors of her disease. I offered her information

about managing, guiding, or controlling these elements to reduce her suffering. She was simply not interested. Instead she awaits her next episode and looks forward to her suffering. Unaware that dwelling on the problem develops more neural misfiring, as more synapses are formed in that brain area, she has no intention of fixing any one of the possible weaknesses, or getting help. In a way she chooses to suffer over choosing to learn or change. Perhaps out of habit. Perhaps out of misguided belief that it is 'good' to suffer. Or perhaps because she does not realize living in mastery over such suffering is possible. She may not have enough hope left to desire living without the pain and chaos her migraines cause, or worse, our current health care system leaves people stranded in the cold condemning them to a life "fulfilled" with endless and unnecessary pain and suffering.

Likewise, I am a friend of a 64 years old man who has defied common sense and the golden rules of nutrition, survival and neurobiology as well. He has a cup of coffee for breakfast, for lunch he indulges in carbohydrates and red meat, drinks beer regularly, loves salty foods, does not drink water, and does not eat any vegetables, fruits, fish or grains. His blood pressure, his weight, and his cholesterol levels are within his age range. His energy levels are of a 25 year old man. I "blame" his genetic make up for such an outstanding and unusual health condition. Cases like my friend are the exception but not the rule. The rest of us have to face the music of our genes influenced by our healthy or unhealthy lifestyle.

People who know their behavioral, biological, or environmental weaknesses take full responsibility for their actions and love to steer, direct, and guide their lives. For them my zero theory or total happiness as I define it as: *"the mental and body states of experiencing right here, right now, within time and space, where nothing is desired and plenty is experienced; a state of wholeness"* is the ultimate life reward.

As of publication of this book, December 2007, I am making substantial progress toward healing. I have learned not to let my guard down, otherwise my mental disorders return with a vengeance. In other words I understand I take responsibility walking a razor's edge keeping the vicious circle at bay, somehow. Mental disorders are relentless in inflicting misery on those unfortunate enough to experience them. We the sufferers are resilient so are these disorders. But we have the power to adept and therefore will prevail.

I dedicate this book to the memory of my beloved brother, Alberto Sanabria, M.D. Had I known sixteen years ago what I know today he and I would still be enjoying life together. My brother was a brilliant young medical doctor who possessed everything a human being could want: intelligence, good looks, a passion for life, and a noble career caring for other people. He succumbed to a disease that given the right tools and knowledge could have been prevented: alcoholism. Alberto was an alcoholic. At only 30 years old he was the victim of drunk driving. Like any addiction, alcoholism must be prevented at the right moment, preferably before it gets out of control.

This book is also dedicated to the millions of people whose lives will be touched, at one time or another, by depression, stress, anxiety, and anger, phobias, alcohol, drug addictions, SAD (Seasonal Affective Disorder) and other vitality sapping mental illnesses. I hope that this book offers some aid in alleviating their pain and suffering.