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# Love - What's the Brain Got To Do With It? On The Book *A General Theory of Love* by Lewis T., Amini F. & Lannon R

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Much has been written about the neurobiology of maternal love and about brain correlates of romantic love. However, *A general theory of love* goes beyond these issues to address the broader issue of how our nervous systems are interconnected, how and why relationships function, how parents shape their child's developing self, and how psychotherapy works.

As a neuroscientist who is in constant search of integration and synthesis of the neurosciences and the experience of life, this book, although followed by more recent books, is groundbreaking and a continuous source of inspiration for me in my research, teaching, and helping people grow and thrive.

*A general theory of love* was written by three psychiatrists yearning to better understand their patients and the human condition. As they write in the first chapter, "*When each one of us [the authors] came to grapple with the emotional problems of our patients, we saw that the old models provide diagrams to a territory that cannot be found anywhere within a real person. Our patients never behaved as predicted. They did not benefit from what the models prescribed, and what did help them had never been taught to us. Unless we stretched and contorted it past the breaking point, that framework for understanding emotional life failed to elucidate the stories of the patients we met in our offices every day. And so we sought elsewhere for clues to the heart's perplexing conundrums*."

In its very elegant and poetic way, this book carries an important message to those seeking to bring change and help healing and transforming of self and others.

Inspired by Vladimir Nabokov's words that "*there can be no science without fancy and no art without facts*", the authors take us to a journey into the meaning of human relationships and love and convey the message in a manner that is neither too scientific nor too simplistic. Recognizing the limitations of scientific language the authors call on poetry, literature and the physical arts to explore the extent and vitality of the mind-heart connection. Thus, you would often find Shakespeare, Freud, Darwin and Frost interspersed within sections about genetics, biology or evolution.

The book has the structure of an argument. Elements from neurodevelopment, evolutionary theory, psychopharmacology, neonatology, experimental psychology, and computer science are elegantly pieced together to form an argument that becomes clearer as the reader progresses through the book. The path for this journey is multi-lane - one travelling through the mewling of lost puppies, isolated monkeys, relativity theory, facial expressions, why menstrual cycles of women spending time together synchronize, why people hold hands at movies, how blind babies know how to smile, and why reptiles don't.

As the authors state in the preface of the book: "*Every book, if it is anything at all, is an argument: an articulate arrow of words, fledged and notched and newly anointed with sharpened stone, speeding through paragraphs to its shimmering target. This book-as it elucidates the shaping power of parental devotion, the biological reality of romance, the healing force of communal connection-argues*

*for love. Turn the page, and the arrow is loosed. The heart it seeks is your own*."

Initially, this arrow of words is moving through the study of the evolution of the brain. The authors introduce the reader with McLeans Triune Brain model. The model describes the brain as consisting of the Reptilian brain, Limbic brain and the Neocortex. The evolutionary process related to the development of our brain over millions of years is explored, starting with the reptilian brain's autonomic necessity (basic survival functions), moving onto the limbic brain (emotion), and finally the neocortex portion of the brain (reason, speech etc.). This most recently evolved brain structure is often considered as the masterpiece of all creation, the top of the mental food chain.

The authors describe the intricate bonds and balances among the three brains, including communication problems that stem from the fact that each of the three brains was created during a different evolutionary stage. The reader is also invited to doubt the superiority of our newest brain (neocortex). The authors describe how "*words, good ideas, and logic mean nothing to at least two brains out of three*." Only the latest of the three brains understands logic and reason. Thus, most of our mind does not take orders and we cannot direct our emotional lives in the way we control our hand while reaching for a cup of tea. We simply "*cannot will ourselves to want.*" As the authors write, "*He cannot will himself to want the right thing, or to love the right person, or to be happy after disappointment, or even to be happy in happy times. People lack this capacity not through a deficiency of discipline but because the jurisdiction of will is limited to the latest brain and to those functions within its purview. Emotional life can be influenced, but it cannot be commanded." The authors argue that our neocortical capacity of thinking can easily mask other more obscure mental processes and cite as support Einstein's proposition: "We should take care not to make the intellect our god; it has, of course, powerful muscles, but no personality. It cannot lead; it can only serve*".

In the context of therapy, the differences in the languages that the three parts of our brain speak and the illusion of the superiority of the neocortex present a potential problem when we come to solve emotional distress through our logical, verbal neocortex. As the authors describe it, *"People rely on intelligence to solve problems, and they are naturally baffled when comprehension proves impotent to effect emotional change…."*. The idea of the integration of all three brains seems to be calling professionals in therapeutic fields to apply a variety of techniques that communicate with these three very distinct qualities residing inside our skull.

After the description of the triune brain model and the relationship of its parts, the authors delve deeper into the limbic (mammalian) brain. The limbic emotional system is described as a delicate apparatus that specializes in detecting and analyzing the internal state of another person. Human infants show early interest in faces and exhibit extraordinary ability to detect and express emotions. Moreover, babies not only continuously monitor their mothers' expressions but also require synchrony (mutually responsive interaction). The authors compare the ability of a human baby to detect emotion with the extraordinary ability of a bat to hear a fly in a noisy jungle and an eel to detect its prey using its electric field.

The authors present the concept of limbic resonance as referring to the "*symphony of mutual exchange and internal adaptation whereby two mammals become attuned to each other's inner states*." Thus, when we meet another person two nervous systems create a palpable apposition. This leads directly to the idea that the relationship is much more than an abstract idea, but rather a "biochemical intervention" that has the potential of changing our physiology and even anatomy. The relationship between maternal care or deprivation and a baby's resulting behavioral and physiological responses are described. The authors briefly summarize the relationship between specific maternal behaviors and various functions such as sleep, cardiovascular, endocrine, immune, and metabolic.

The ideas presented in *A general theory of love* are supported by more recent research elucidating the mechanisms by which we influence each other. Cozolino in his wonderful book, *The Neuroscience of Psychotherapy*, reviews the various ways by which early infant-parent relationship can affect brain plasticity and learning, the ability to cope with stress, and future maternal behaviors (Cozolino). Recent research across species discovered over

900 genes that are differentially expressed based on the amount of maternal behavior (Rampon et al. 2000; Weaver et al., 2006). Another beautiful attempt to traverse the gap between neuroscience and the clinical practice is Hart's book *Brain, Attachment and Personality* (Hart, 2008). Both Cozolino and Hart describe how early experiences and attachment styles shape the structure and the function of our brains and are important landmarks in the literature of interpersonal neurobiology.

However, *A general theory of love* takes it beyond childhood. The authors, using scientific research, demonstrate that this symphony between our nervous systems, probably beginning in utero, continues into adulthood. Our nervous systems are not self-contained. Our brains are an open-loop system linking with those close to us. A baby's physiology is maximally open-loop because babies are dependent - for their survival - on limbic regulation. Love, and the lack of it, change the young brain forever. But not only does it affect the young brain. Limbic regulation mandates interdependence for social mammals of all ages. This silent rhythm between nervous systems alters the very structure of our brains, establishes life-long physiological and emotional patterns, and makes us, in large part, who we are.

Thus, adults remain social animals and they continue to require a source of stabilization outside themselves. The authors state that "*The open-loop design means that in some important ways people cannot be stable on their own- not should or should not be, but can't be*." This is also supported by ample research showing that cardiovascular function, hormone levels, and immune processes are disturbed in adults subjected to prolonged separation. Ornish (2000) in his book *Love and Survival* surveyed the medical literature on the relationship between isolation and human mortality. He concluded that solitary people have a vastly increased rate of premature death from all causes and they are three to five times likelier to die early than people with ties to a caring spouse, family, or community. For example, social isolation tripled the death rate following a heart attack. Likewise, illness or death often follows the end of marriage or the loos of a spouse. On the other hand, group therapy doubled the postsurgical lifespan of women with breast cancer. Similarly, leukemia patients with strong social supports had two-year survival rates more than twice that of those lacked them. These and similar findings provides further support that human interaction has tangible effects on our physiology.

Towards the end of the book the authors describe the pains and aches of modern western society in the context of a mismatch between the way our brains have evolved and the cultural milieu in which we live. They describe how our society, that cherishes individualism and self-sustainability, dangerously flouts essential emotional (limbic brain) laws. Implications of this limbic deprivation are discussed in the context of interpersonal relationship and love. This, and the tendency we have towards emphasizing independence rather than interdependence, affects the way we raise our children, the way we educate and the way we view psychotherapy.

The authors take us on a fascinating journey through cognitive processes such as schema and attractors, Hebbian learning, neural networks, and mirror neurons to explain how our brains integrate our past and present experiences and how limbic transmission between people happens. They highlight the importance of the connection between the therapist's limbic system and the patient's one in the context of therapy. The authors write about the therapeutic process *"... talk about this, not that; answers questions, or don't; sit facing the patient, next to the patient, behind the patient. Yet, no [therapeutic] approach has ever proven its method superior to any other. Strip away the therapist's orientation, the journal he reads, the books on his shelve, the meetings he attends- the cognitive framework his rational mind demands- and what is left to define the psychotherapy he conducts? Himself. The person of the therapist is the converting catalyst..... the agent of change is who he is*". Research into the factors associated with client outcome support this idea. Lambert (2001) found that empathy, warmth, and the therapeutic relationship correlate more highly with client outcome than specialized treatment interventions. Decades of research indicate that therapy is an interpersonal process and that the main curative component is the nature of the therapeutic relationship. Employing the ideas presented in the book, we must keep in mind that our limbic connection is the foundation of our efforts to help others.

Let's go back in time 70 years to Carl Rogers. Rogers specified the conditions that he considered to be both

necessary and sufficient for therapeutic change to occur: counselor congruence or genuineness in the therapeutic relationship, warmth, ability to empathize, communication of empathy, and unconditional positive regard (Rogers, 1942). Although this has been proposed years ago, we often find it useful when science (our culture's neocortex) re-discovers, validates, and reminds us what our hearts already know.

Using McLean's concept of the triune brain, I could describe *A general theory of love* as a wonderful and rare bridge between our rational neocortex and our emotional limbic life, creating a multi-lane highway from the authors' ideas and feelings to our own brains, minds, and hearts.

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