

The Biocognition of Personal Ethics: Does the Immune System Have Morals?

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FROM BIOETHICS TO BIOSYMBOLS

Although the *fight or flight* consequences of stress have been widely accepted as contributors to many illnesses due to sustained cortisol release and its effects on immune regulation, there is mounting evidence that emotions triggered by moral violations and cultural admonishments can be as damaging through other immunological processes.¹

In my theory of *Biocognition*² (how cultural and spiritual beliefs affect health and longevity), I propose that “bioethics” should encompass more than the tenets for moral and humanistic behavior in the life sciences. From a *biosymbolic*³ premise, it is also the psychoneuroimmunological⁴ responses to behavior that violate the ethics assimilated from cultural and spiritual beliefs. Violations of personal ethics cause imbalances that can lead to illness without necessarily having increases in cortisol. For example, there is a differential immunological response to shame versus guilt as measured by proinflammatory secretions⁵. Moreover, one of the more powerful immune enhancers is triggered by observing or experiencing acts of compassion as measured by increased protective immune function.

In this paper, I present a *Biocognitive* model that takes bioethics beyond its philosophical domain to address how biology is affected by moral violations (e.g. guilt), by cultural admonishments (e.g. shame), and by exalted emotions (e.g. compassion).

While the fight or flight model elegantly demonstrates how threats to physical or emotional safety trigger stress hormones, the biocognitive model addresses how violations of moral tenets affect other immune functions that appear to be more sensitive to ethical consciousness than to survival behavior. Consequently, while stress hormones and proinflammatory products⁶ can contribute to illness, the more exalted emotions that support humane principles can enhance immune function to promote healing. In the appropriate sections of this paper, I will cite research literature to propose how the immune system functions within a bioethical model.

As biosymbolic beings, our language and imagery have a bidirectional connection with our biology. In this mind-body *coauthoring*, our emotions and sensations function as autogenic feedback for our intentions and actions. The admonition “words can kill” gain significance in cultures that believe a curse from a black magic practitioner is lethal. Conversely, since biosymbols are culture-specific, hexing is ineffective outside its consensual reality. Indeed, biosymbolic processes encompass much more than hexes as reflected in the effects of placebo and nocebo noted in the medical anthropology literature.⁷

The culture-specific component of biosymbols is illustrated in studies showing how cognition can affect biology positively or negatively based on expectations.⁸ Since the number *four* is associated with bad omens in China and Japan because the word for that number sounds like the word for *death* in the Mandarin and Japanese languages, Phillips and his colleagues⁹ compared death certificates from 1973 to 1998 of Chinese, Japanese, and Caucasian-Americans, and found a statistical significance for higher cardiac mortality in Asian-Americans on the *fourth* day of every month. The study also

tested the effects of the number *thirteen* (i.e. unlucky number in Caucasian-American culture), and found no lethality associated with that number. The researchers hypothesized that, although the number thirteen is considered “unlucky” by Caucasian-Americans, the word for number thirteen lacks the linguistic association with death that the number four has in the Asian languages cited.

CULTURAL ARCHETYPES AND SOCIAL RULES

Given the cultural values placed on moral principles, it merits clarifying the function of their biosymbolic expression. It is equally important however, to define the fundamental differences between culture and society as they influence the validation of our collective beliefs. In my theory of biocognition, I propose that mind, body, and cultural history develop within a fabric that cannot be reduced to their contributing components. To understand the process of how our symbolic consciousness is molded by cultural and societal parameters, I hypothesize that a *society* imposes the rules that a group agrees to live by, whereas a *culture* instills the aesthetic, ethical, transcendental, and wellness consciousness that a group assimilates. While societies are driven by socioeconomic variables entrenched in power agendas (consumerism, politics etc.), cultures are sustained by their archetypal symbols (concepts of motherhood, fatherhood, victimhood, heroism etc.). Consequently, societal compliance is ego-controlled by fear and vanity, whereas cultural assimilation seeks self-meaning and self-expression by identifying with their archetypes. Societies manipulate stressors, and cultures inculcate archetypal coherence.¹⁰

There is ample historical evidence to support that cultures are more enduring than societies. Although Spain was occupied by the Arabian Empire for seven hundred years, and Ireland was under British rule for eight hundred years, both “conquered” nations maintained their religion, language and other cultural archetypes, while adhering to the social rules of their conquerors. I submit that, because of their pervasiveness, cultural archetypes have greater biosymbolic significance than social rules. To illustrate: a traffic violation (i.e. breaking a social rule) may trigger a cascade of stress hormones resulting in increased cortisol blood levels, whereas a teacher shaming a student (i.e. cultural admonition) can cause the release of proinflammatory products not unlike an immunological response to infection. Thus, from a biocognitive perspective, bioethics is broadened from its philosophical domain (i.e. cognitive parameters) to encompass its biological expression.¹¹ It appears biosymbols can mimic threats to safety in the absence of real danger, as well as signals of infection in the absence of pathogens, by “tricking” the immune system to respond as if biology rather than symbol were at play.

THE BIOCOGNITION OF ETHICS

If we envision bioethics beyond its conventional lexicon to include the biology of morals, we can explore the question of innate goodness vs. conditioned humaneness. In investigating the genesis of our exalted emotions, Hoffman¹² found that when newborns hear another infant cry, they also cry. To rule out imitative behavior, newborns were exposed to recordings of their own crying and of other infants. The results showed that only live crying from other infants elicited what Hoffman calls *precursors of empathy*. Considering empathy and the more developed emotion of compassion as the foundation

of ethical behavior, may begin to answer whether humans are born inherently good or with a clean slate to be shaped by social conditioning.

The evidence for empathy precursors suggests that our biocognitive design includes a predisposition for kindness. And when these primal empathy constructs develop into more complex biocognitions like compassion, truth, honor, loyalty and other exalted behavior, their violations may trigger a biological reaction to signal dissonance between humane beliefs and malicious action. Thus, this inherent entanglement of cognitive righteousness and exalted emotions, offer evidence to consider *ethics* as the disembodied abstraction of bioethics: the former being the cognition of moral conduct, and the latter its biosymbolic integration.

There may be a primal bioethical design in complex emotions such as empathy and compassion when one considers subjects who simply observe the expression of those emotions (e.g., watching a video of Mother Teresa tending to her patients) show increased levels of immunoglobulin type A antibodies (IgA).¹³ Conversely, subjects who were shown a video of the Nazi army committing atrocities, had significant decreases in levels of IgA's (McClelland and Kirshnit, 1988). It is interesting to note that, although IgA levels increase when subjects are exposed to acts of compassion, levels drop after less than twenty minutes in subjects with a cynical mindset, whereas subjects who hold a more optimistic view of the world maintain gains significantly longer (McClelland, 1989). IgA decreases associated with cynical interpretations of compassionate acts may indicate that unsustainable gains are due to unresolved bioethics.

Bioethical interpretations may also affect contextual relevance at a *cyticultural* level – defined as the idiosyncratic history shared by a group of cells (Martinez and

Santiago, 2007). It appears that immune cells may respond to psychosocial behavior based on intercellular history. For example, Solomon, Kemeny, and Temoshok (1991) found that simpler but phylogenetically older immune cells such as natural killer cells (NK)¹⁴ respond to global social behavior (assertiveness), whereas more complex but phylogenetically younger immune cells such as T cells (CD4 and CD8)¹⁵ respond to more specific circumstances (reduced anxiety about illness). Phylogenetically older immune cells may have developed greater diversity due to a longer history of contextual challenges (George F. Solomon, personal communication, October, 28, 2000).

BIOETHICAL CODES

Both, the nervous and the immune system, are cognitive interactive entities in that they learn, remember, and respond, based on their acquired history (long-termed memory) and their contextual interpretations. Both systems respond in unison against emerging challenges with novel strategies that were not genetically predetermined. In other words, rather than responding based on a fixed genetic template, the nervous and immune systems learn and adapt based on new challenges. Since the nervous system stores survival strategies as neural patterns, and since the immune system is a co-participant in the creation of these essential memories, a *biological self* and a *psychosocial self* must be codified to respond in unison to physical (concrete) and cognitive (interpreted) threats.

Emotional avoidance is associated with diminished NK cell activity. Conversely, Naliboff and Solomon (1995) found that increased assertiveness triggers activity in confrontational immune cells such as NK (CD56). Thus, assertiveness (psychosocial self)

and confrontational immune cells (biological self), co-participate to protect with mind-body unison. It should be noted that I differentiate between psychosocial self and biological self to illustrate cooperative functions of an indivisible biocognition, rather than to imply a Cartesian mind and body split.

I now introduce the term *biocognitive self* (i.e. cognition and biology contextualized within a cultural history) to encompass the *coauthoring* of biological self and psychosocial self. If biocognitive self can be heuristically viewed as a biopsychosocial (i.e. biocognitive) interactive entity that defines, protects, and validates the mind-body integrity of a human being, then there must be rules of engagement to differentiate self from non-self in situations of biological challenges and cognitive dissonance. I propose three *bioethical codes*¹⁶ as mediators to resolve biocognitive (i.e. both physical and cognitive) challenges to the integrity of biocognitive self.

A *horizon code* is proposed as the cognitive and biological rules that determine the external horizons of a *belief field*, as well as define what is biocognitive self and non-biocognitive self. The horizons of the code are maintained cognitively with expectations of reduced safety, and biologically with nervous, immune and endocrine system (stress hormones, immunological deregulation etc) responses. The cognitive-affective parameters of the horizon code serve to maintain biocognitive self within known territory and to signal when the boundaries are reached. If the horizon parameters fail to maintain biocognitive self-coherence, a *regulatory code* is activated to address the violations of horizons with more aversive biocognitive controls. Transgressions are dissuaded cognitively with apprehensions of dangerous outcome, and affectively with volatile emotions. In order to assimilate new information, however, a *discovery code*, through the

expression of our more exalted cognitions and emotions, serves to expand the horizons of biocognitive self. The cognitive-affective composition of the discovery code facilitates the acquisition of knowledge by replacing *entrenchment* with *exploration*. The expansion of horizons occurs cognitively through faith (i.e., action with propitious expectations) and affectively with empathy and compassion. Faith, in this treatise, does not refer to a religious belief, but rather to expectations where the actual outcome will be perceived as the best fit. The bioethical codes define, regulate, and expand biocognitive self during external and internal challenges. The cognitive-affective modes of each bioethical code have differential effects on the external horizons of biocognitive self. While the cognitive-affective components of the horizon and regulatory codes define and impose entrenchment on the external horizons respectively, the discovery code's function is to expand the external horizons and facilitate the ontogenesis of biocognitive self.

CONCLUSIONS

Since the rules of engagement to maintain integrity of biocognitive self (i.e. bioethical codes) are learned within a cultural history, the inculcated *ethics* (cultural rules of conduct) become *bioethics* (embodied philosophy). Thus, philosophy embraces biology in an inseparable fabric where adherences (honor, commitment and loyalty) as well as violations (shame, abandonment and betrayal) have differential biocognitive consequences. "Bioethical" philosophy becomes one with the biology of ethics.

Understanding that moral conduct has biological consequences and, more importantly, that it can affect health by how adherences and violations are processed by the immune system, teaching ethics can no longer be limited to scholarly discourse.

Bioethics must be advanced to more than a study of moral conduct. And the lesson to convey, is that conduct affects health because our immune system appears to have morals.

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NOTES

¹ The stress model proposed by Hans Selye in the 1950's, known as the General Adaptation Syndrome (GAS), specifically addressed the release of cortisol and other hormones during a *fight or flight* experience. More recent work (cited in the appropriate sections of this paper) demonstrate there are other immunological products that respond to ethical violations and cultural admonishments rather than to physical or emotional safety threats.

² See Mario E. Martinez, "The process of knowing: A Biocognitive epistemology." *Journal of Mind and Behavior*. 22 (4), 407-426, Fall 2001.

³ I define *biosymbolic* as a mind-body representation that has positive or negative biological expression. I argue that ethical constructs such as commitment, honor and loyalty have empowering (immune-enhancing) functions, whereas, respectively, abandonment, shame and betrayal have disempowering (immune deregulating) consequences. Thus, a biosymbolic expression is the biological response to the cultural interpretation of a word, thought or symbol. For example, words like *rapist*, *saint*, *mother*, and symbols like *flag*, *cross*, and *skull & bones*, engage physiological processes that are expressed according to their cultural context.

⁴ Psychoneuroimmunology is the interdisciplinary field that studies how thoughts and emotions affect the immune, nervous and endocrine systems.

⁵ See S.A. Dickerson, M.F. Kemeny et al. Immunological Effects of Induced Shame and Guilt. *Psychosomatic Medicine* 66, 124-131.

⁶ Cortisol is a hormone that can signal immune suppression when triggered by a fight or flight condition. Proinflammatory products are immune system molecules (cytokines) that cause inflammation in order to surround an infected area. It has been recently discovered that shame can also trigger the release of these cytokines. While sustained secretion of cortisol reduces immune function making the organism more vulnerable to opportunistic viruses and bacteria, prolonged proinflammatory secretion, in the absence of infection, can contribute to cardiovascular disorders and rheumatoid arthritis.

⁷ See Lola Romanucci-Ross, Daniel Moerman & Laurence Tancredi, Eds., *The Anthropology of Medicine: From Culture to Method*. Bergin & Garvey, London, 1997.

⁸ See R .A. Hahn, *Sickness and health: An anthropological perspective*. New Haven: Yale University Press, 1995.

⁹ See D.P. Phillips et al., The Hounds of the Baskervilles effect: Natural experiment on the influence of psychological stress on the timing of death. *British Journal of Medicine* 323, 1443-1446, 2001.

¹⁰ In my view, society is a group consenting to rules of control that create imbalances through fear (i.e. “if you don’t comply, you will pay with an aversive consequence”) or through vanity (i.e. ‘if you don’t adhere to our enticement you are not worthy’) in order to achieve its objectives. Culture, being the collective archetypes assimilated by a group, maintains coherence through ethical rules and moral judgment.

¹¹ This broader dimension of bioethics integrates the moral philosophy of the life sciences within a culture, with the psychoneuroimmunological consequence for adherences and/or violations by its members. For example, the biocognitive model addresses the bioethical behavior of a medical culture as well as its social delivery systems (e.g. fear-based marketing, medical hexing etc.) in order to assess the psychoneuroimmunological effects on its practitioners and patients.

¹² Martin Hoffman. *Empathy and Moral Development: Implications for Caring and Justice*. (2000) Cambridge University Press: London.

¹³ IgA’s are antibodies found in saliva and other mucus membranes which fight upper respiratory virus.

¹⁴ Natural killer cells (NK) are a type of lymphocyte that is part of the innate immune system. NK cells play a major role in the rejection of tumors and cells infected by viruses.

¹⁵ T cells belong to a group of white blood cells known as lymphocytes. They can be distinguished from other lymphocyte cells such as B cells and NK cells by the presence of a special receptor on their membranes called T cell receptor (TCR).

¹⁶ Bioethical codes are cultural rules of conduct that are interwoven with our biology rather than the conventional philosophical term “bioethics” that defines what is ethical medical practice. Thus in biocognitive theory *bioethics* literally translates to the psychoneuroimmunology of ethics.

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