TOWARD THE NEUROBIOLOGY OF THE ENNEAGRAM

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ABSTRACT

Most accounts of the Enneagram describe relationships between each of the three major triads and the negative emotions of fear, anger, and sadness/social distress. This paper, which is primarily a thought experiment, explores those relationships from a perspective drawing on contemporary scientific thinking in the fields of neurobiology, emotion, emotion regulation, and evolutionary biology. The hypothesis presented here is that the structure of each of the nine Enneagram types is built around a particular pattern of emotion regulation relating to innate mammalian emotion systems governing fear, anger, and social distress. These patterns emerge in early life as cognitive-emotional structures which reside in neural networks responsible for emotion generation and its regulation. From a neurobiological perspective, we are born with a brain that has innate emotional capacities and temperamental tendencies. However, these tendencies must be "tuned" to and by actual life experience to create reasonably stable and socially functional emotion systems. One manifestation of these cognitive-emotional structures is Enneagram type. The bad news is that Enneagram emotional and mental "habits" are rooted in primal emotion systems. The good news is that these systems remain teachable throughout life, and that neurobiology provides insight into the processes of growth that take place as we begin to work seriously with our type. From a scientific perspective, it may be that the characteristics of each Enneagram type represent a fundamental skill set required for navigating human inner emotional terrain. It may also be the case that the variety of different types has been central to the evolutionary success of our innately social species.

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INTRODUCTION

In working with our type, one of the most important things we learn is to intercept and attend to the signals of feeling that manifest as bodily sensations and that precede the cascade of type reactivity. For example, I have come to recognize a tightening in my belly, and a slight flaring of my chest and nostrils (I hope imperceptible to others) as sure signs that anger is in there somewhere (I am a Nine).

We also learn from narrative accounts that everyone, regardless of type, shares similar experience as type reactivity kicks into gear, although the particular feelings and sensations vary considerably. These largely non-conscious inner bursts are signals of emotion sounding a warning that something seems amiss and needs our attention. Even with awareness it takes a lot of inner work and outer practice to interrupt them, but as we learn to do so we develop the option to choose more consciously what happens next.

This learning has been by far the most valuable gifts of this wisdom tradition in my own growth as a person, and as an Enneagram teacher. As a scientist I am also intensely curious about why, from a biological perspective, the patterns of type exist in humans. How do they operate? What is going on in the brain?

This paper is primarily a thought experiment. In it I offer some ideas on answers to these questions, drawing on contemporary literature and concepts in the fields of research on mammalian emotional systems and emotion regulation. It is not an exhaustive scholarly review of these topics. Happily, there is enormous congruence in modern science and classical Enneagram teachings. I also offer some thoughts on the potential for the Enneagram to contribute to an ever-deepening scientific understanding of the origins and operations of human consciousness. The work presented here grows out of a deeply rewarding and ongoing collaboration with Dan Siegel, David Daniels, Denise Daniels and Laura Baker. That project attempts to present the Enneagram in contemporary scientific terms to a scientific audience, and work on a paper aimed in that

direction is nearing completion. I am especially indebted to my four colleagues for their teaching, enthusiasm, support and encouragement.

THE MAMMALIAN BRAIN

There is now abundant evidence that even the most primitive animals experience emotions. (Panksepp, 1998) Expressions of fear and anger are evident across the animal kingdom. Evolution has equipped animals with innately installed emotional systems (such as for fear and anger) because these systems helped their evolutionary ancestors address matters of constant and critical importance to survival. For example the detection of the passing shadow of a predatory shark by small prey fish ignites fear which sends them scurrying quickly toward the safety of cover. Such systems serve obviously important self-protective ends by focusing attention, marshalling body processes needed for an appropriate response, and fueling responsive behavior.

Evolution has provided mammals with a particularly sophisticated set of innate emotional systems which fuel and shape the complex patterns of mammalian relational behavior and societal structure. The mammalian brain also has capacities to embed emotion in memories. This gives mammals a powerful set of learning abilities and adaptive skills that have been central to their – and that includes our – evolutionary success. (Panksepp, 1998; Siegel; Lewis, et al)

In order to understand better the ways in which emotional systems function and how they relate to the Enneagram, it is useful to consider a conceptual model of the mammalian brain, developed by Paul MacLean in the middle of the last century. In his "triune" model, McLean identified three major layers brain "layers" that have emerged in the course of mammalian evolution (see figure 1). (Holden; Panksepp, 1998)

The reptilian brain, the innermost and oldest of the three, controls a number of vital bodily functions and drives (e.g. hunger and thirst), and primitive behavioral responses related to fear, anger, and sexuality. Its processing and output are rapid, efficient, and highly purposeful, but relatively rigid, automatic, and pre-programmed.

Surrounding this reptilian brain core is the limbic brain (also called the old mammalian or proto-mammalian brain), which appeared in full form with the emergence of mammals. Among its many important attributes is the capacity to incorporate emotional content in memory, and to very rapidly assign emotional "charge" – either positive or negative – to new experience based on its similarity to previous experience in memory. In other words facets of new experience that resemble facets of previous experience "automatically" evoke emotional response. The limbic brain also contains the roots of newer (in evolutionary terms) programs related to the social emotions (e.g. see CARE and PANIC, which will be discussed shortly).

Surrounding the limbic system is the outermost layer, the neocortex (also called the new mammalian brain). It is the most recent feature to emerge in the course of brain evolution. The neocortex is a learning and "sense-making" machine. It assimilates information from many sensory, emotional, and physiological sources; holds these assimilations as composite memories of experience; and associates and relates facets of new experience to memory of past experience with similar facets. In a very real sense the neocortex constantly scans current experience for familiar patterns in order to make sense of it. Because of the neocortex, in many ways we literally do see what we are looking for. Compared to the other two "layers", processing of information by the neocortex is relatively slow.

Among all mammals the reptilian brain and the limbic system contain the same structural components and, corrected for body size, are essentially the same size. The neocortex on the other hand exhibits enormous variation in size across mammalian species, being relatively small in foragers, larger in predators, still larger in primates and cetaceans (whales and porpoises), and reaching an apex in humans where it is relatively massive.

It is important to note that the boundaries between the three layers are not sharp and clear. Furthermore, contrary to some depictions the three layers are extensively interconnected, serving different functions but generally working in concert. Thus, for example, human emotional systems consist of complex networks of neurons coursing through the entire brain, connecting specific areas of the reptilian, limbic, and neocortical layers. (Pessoa)

EMOTION

Over the past two decades there has been an explosion of scientific interest in and research on emotion and emotion regulation. In large part this has been enabled by major advances in imaging technology which permit some degree of objective measurement (and thereby scientific investigation) of the vast array of highly dynamic processes and experiences that collectively fall under the label of "emotion". Much remains to be learned in the booming field of emotion research, but information is emerging which sheds important and extremely interesting light on our study of the Enneagram.

There is not a consensus definition of emotion, and there may be almost as many taxonomies of human emotion as there are scientists in the field of emotion research. (Langlois) However, there seems to be reasonably broad consensus around several major concepts. (Gross and Thompson, 2007) First, emotions function as central value systems. They arise when attention is directed toward some facet of experience that is important to the pursuit of goals. In this context the term goals encompasses a wide spectrum ranging from unconscious and fundamental (e.g. survival in the face of a predator) to conscious and complex (anticipating an exciting vacation or competitive event). Second, emotions are "multi-faceted, whole-body phenomena that involve…subjective experience (i.e. feelings), behavior, and central and peripheral physiology…Emotions not only make us feel something, they make us feel like *doing* something". (Gross and Thompson, 2007) Finally, although they make us *feel* like doing something, what we actually *do* is most often dependent on the context and other responses that may be generated by the experience.

Most taxonomies of emotion identify a discrete and relatively small number of "primary" emotions – that is, emotion which arises from innate systems within the brain. Examples will be described in more detail shortly, but they may be thought of as analogous to the "primary colors" of emotion. Most researchers also seem to agree that emotion can manifest in primary form, and also as "secondary" mixtures of two or more primary emotions which can blend to create a richer emotional palette with more nuance. There is very broad agreement that cognitive processes interact with emotion to further influence the intensity, duration, experience, expression, and other attributes of the feeling states and physiological responses that result when an

emotion is aroused. Such interactions are very much responsible for the enormous range of human feeling states and moods. (Gross and Thompson; Hoeksma; Izard)

Emotion researchers generally agree that emotions, whether primary or secondary, have either a positive or a negative quality. In this context positive and negative refer to the "charge" or valence of the feeling state, not to good vs. bad, or healthy vs. unhealthy. In a general sense, negative emotions produce relatively unpleasant or aversive feeling states and serve as signals of problems that need attention, while positive emotions tend to motivate "more" or "toward" behaviors and are generally associated with relatively pleasurable feeling states. There is surprisingly broad agreement around the number and nature of a a small cluster of primary negative emotions, with some variation of fear, anger, and social distress appearing on all (or virtually all) lists. Other negative emotions, such as shame or resentment, are generally considered to be secondary or learned. The number, labels, and characteristics of "positive" emotions vary considerably across different emotional taxonomies. (Izard; Gross; Panksepp, 1997, 2005; Siegel)

It is extremely difficult to study emotion in humans because the cognitive and emotional components of adult human inner experience are inextricably intertwined, and the extraordinarily powerful cognitive capacities of the human mind command center stage in our theater of awareness. In addition the "language" of emotion is experiential, subjective, and often soft or subtle. It is useful, therefore, to examine emotion through the lens of animal research.

The work of Jaak Panksepp, an experimental neurobiologist whose career has focused on the study of mammalian emotional systems, is representative and provides a useful and comprehensive model for examining the undercurrents of emotion running beneath the more visible currents of cognition. Panksepp identifies seven primary emotional systems which he believes are shared by all mammals, and which he labels as FEAR, RAGE, PANIC, SEEKING, CARE, PLAY, and LUST. FEAR, RAGE and PANIC are the primary negative emotional systems, while the other four may be regarded as "positive". (In Panksepp's taxonomy "PANIC" essentially equates with the more commonly used term of "social distress").

Panksepp describes the role of these systems in this way:

> "In more simple subjective terms, we might say that these systems generate an animal's egocentric sense of well-being with regard to the most important natural dimensions of life. They offer solutions to such survival problems as: How do I obtain goods? How do I keep goods? How do I remain intact? How do I make sure I have social contacts and supports? Such major survival questions, which all mammals face, have been answered during the long course of neural evolution by the emergence of intrinsic emotional tendencies within the brain." (Panksepp, 1998)

In the following brief overview of each of these seven systems (Panksepp, 1998 and 2005), I will maintain Panksepp's convention of capitalizing when referring to the SYSTEMS, in order to help distinguish them from other uses of the same words.

FEAR

Fear may be the most ancient emotional system because "An organism's ability to perceive and anticipate dangers was of such obvious importance during evolution that it was simply not left to the vagaries of individual learning." (Panksepp, 1998) The basic function of the FEAR system is to quickly orient the animal toward imminent physical danger, to mobilize the senses, and to trigger various protective physiological responses and behaviors (including flight, fight, and freeze). Fear is experienced as an aversive, apprehensive, tense state, which tells the animal that its safety is in peril.

The mammalian FEAR system is an elaboration on similar systems of evolutionarily more primitive animals, in which fear is aroused primarily by unconditioned stimuli. The mammalian brain is also capable of encoding fear into memory, which can then influence future novel experience. In addition, the mammalian brain is capable of considerably more modulation of this system than the reptilian brain.

RAGE

The basic function of the RAGE system is to empower the animal and energize aggressive, defensive or offensive behavior in pursuit of freedom (e.g. from a predator) or various needs or desires (e.g. toward a competitor). It is

aroused by bodily irritation, confinement, or thwarting and frustrations. In experimental settings many stimuli can provoke this system "…but the most common are the irritations and frustrations that arise from events that restrict freedom of action, or access to resources or expected rewards (Panksepp, 1998)."

The RAGE system also plays a central role in defense by arousing fear in opponents. Not surprisingly, the RAGE and FEAR systems are both anatomically and functionally close to each other. As Panksepp notes, "It makes good evolutionary sense for FEAR and RAGE circuits to be intimately related, for one of the functions of anger is to provoke fear in competitors, and one of the functions of fear is to reduce the impact of angry behaviors from threatening opponents." (Panksepp, 1998)

Panksepp notes that this system is probably the source of the much of the psychic energy of human anger. As with FEAR, mammals - and particularly humans - are capable of significant regulation of the expression of this system, as manifest in our considerable ability to consciously conceal anger.

PANIC

The PANIC system serves first and foremost to assure protective and nurturing connection between the relatively helpless mammalian infant/child and its caregivers. It generates the alarm signal that tells the child it is alone and needs care, and manifests as the distress cry of the young animal separated from its parent. It also generates feelings of comfort when care is received.

The system is quintessentially mammalian. Panksepp provides an eloquent description of the system's fundamental characteristics.

> "To be a mammal is to be born socially dependent. Brain evolution has provided safeguards to assure that parents (usually the mother) take care of the offspring [see CARE, below], and the offspring have powerful emotional systems to indicate that they are in need of care (as reflected in crying or, as scientists prefer to say, separation calls.) The nature of these distress systems…provides a neural substrate for understanding many other social emotional processes."

> "Just as FEAR and RAGE systems allow organisms to cope with archetypal emergency situations that threaten survival, the separation-distress, or PANIC, system provides mammals with a sensitive emotional barometer to monitor the level of social support they are receiving. If social contact is lost, organisms experience a painful feeling of separation and the young protest (cry) vigorously in an attempt to reestablish contact and care." (Panksepp, 1998)

CARE

As noted above, CARE and PANIC exist in a mirroring or reciprocal relationship. PANIC calls out for CARE. While the specific nurturing behaviors of species differ widely from one to another, this system is present in all mammals and is at the root of the mother-child relationship. It ensures that parents are deeply bonded with and devoted to their relatively helpless offspring. Archetypal images of these two systems at work are the mother gazing lovingly into the eyes of her nursing infant, or Michelangelo's Pieta. There is also good evidence that the CARE system is involved in important ways in the development and maintenance of other social bonds in later life.

SEEKING

The SEEKING system is harnessed by a wide variety of brain systems which are involved in the pursuit of needs and desires of all sorts. It generates pleasant feelings of anticipation and excitement, and is likely one emotional component of exploratory curiosity. Activation of this system…

> "…makes animals intensely interested in exploring their world and leads them to become excited when they are about to get what they desire. It eventually allows animals to find and eagerly anticipate the things they need for survival… In other words, when fully aroused, it helps fill the mind with interest and motivates organisms to move…in search of the things they need, crave, and desire." (Panksepp, 1998)

This system is also an important and efficient facilitator of learning. The pleasant feeling states of SEEKING, when recorded in memory, greatly facilitate mastering of various skills needed for survival. In humans SEEKING may also be a major ingredient in intellectual curiosity and endeavors.

For example it may play an important role in the burst of pleasure that we experience with AH HAH moments. Finally and importantly, the RAGE system can be triggered when progress toward a goal of SEEKING is thwarted.

PLAY

Simply put, the PLAY system is what makes play fun! It is especially active in childhood. It manifests most obviously as the infectious delight and giddiness of children (animal or human) at play. Like SEEKING, it plays a central role in learning, both physical and emotional.

> "Most important, play may allow young animals to be effectively assimilated into the structures of their society. This requires knowing who they can bully, and who can bully them. One must also identify individuals with whom one can develop cooperative relationships, and those whom one should avoid. Play probably allows animals to develop effective courting skills and parenting skills, as well as increasing their effectiveness in various aspects of aggression, including knowledge about how to accept defeat gracefully. It seems that most of the basic emotional systems [both positive and negative] may be recruited at one time or another during the course of play, and in higher organisms, play may encourage organisms to test the perimeters of their knowledge. In short, the brain's PLAY networks may help stitch individuals into the social fabric that is the staging ground for their lives. Is it any wonder, then, that play is such fun – perhaps one of the major sources of joy?" (Panksepp, 1998)

LUST

The LUST system is the source of the range of feelings that motivate us toward and accompany sexual attraction and activity. Although it utilizes similar brain chemistries, it is separate and distinct from the systems related to social bonding. As Panksepp notes, "…it is an inescapable fact of life that evolution has built uncompromising feelings of sexual desire into the brain, as well as the potential for social devotion and deception, which can serve to maximize reproductive success." (Panksepp, 1998) The LUST system illuminates two important features concerning the subtlety and power of all emotion. First, we must learn the meaning of our emotional states. The delights of sexual fantasy and experience arising from

activation of the LUST system are not accompanied by cognitive awareness of their evolutionary function. The former are felt and experienced, while the latter must be learned. And second, the fact that emotion can readily overpower brilliant cognitive genius is revealed in the oft repeated story of sexual affair and subsequent political scandal.

EMOTION AND LEARNING

Both "positive" and "negative" emotions are powerful forces in motivating and governing behavior. They are also central in facilitating learning, particularly the learning through life experience that takes place during infancy and early childhood while mammalian young are cared for and protected by parents and other caregivers. During this time the young mammal is afforded opportunities to safely explore the world, and to practice and develop essential life skills. In the process mammalian young also learn the meaning of negative emotional signals that inevitably arise in the course of experiences such as play, and develop skills in self-regulation of those signals. (Panksepp, 1998; Siegel)

Two simple examples illustrate these points. First, imagine an infant puppy which becomes separated from its mother. Needing but not sensing her protective and nurturing presence, the puppy's PANIC system issues an emotional outburst resulting in a cry of separation distress, which summons its mother. Her return and responses include both attention to her infant's immediate needs, and soothing physical contact that initiates innate pathways of pleasure and relaxation (notably in mother as well as infant). Both are instrumental in restoring the puppy's sense of safety and well-being. Second, imagine a young chimpanzee enthralled in curious exploration of its environment (fueled by the positive emotion of SEEKING), or in the delight of rambunctious play with a sibling (fueled by the positive emotion of PLAY). His mother, watching from a short distance, becomes fearful for his safety because he is climbing too high or playing too roughly and pulls him back. In either case the youngster's RAGE system might well be activated because he is being limited and restrained. The mother responds to his angry outburst with both firm discipline and affection, both of which teach the infant appropriate and self-protective behavior.

EMOTION REGULATION

At the same time the infant develops skills in emotion

regulation. (Cole; Siegel) In other words, learning through experience also develops the capacities involved in maintaining emotional equilibrium. Waves of emotion flow constantly through us, changing with the situation at hand, and the ways in which attention to the situation is directed. (Izard) For example, the anticipatory excitement we feel approaching a good meal subsides as we begin to dig in, to be replaced by other emotional states as the meal unfolds and our attention shifts toward feelings of satiety and contentment.

Sometimes, however, there is a contradiction between our inner emotional state and the outer response which is most adaptive or functional under the circumstances. For example, it would be maladaptive for the young chimp to explode in a fit of destructive fury toward his source of nurturance and protection (who by the way is also much more powerful). Emotion regulation is the broad term that describes the processes by which the brain channels the emotion at hand. In simple terms the emotion can either be sustained and expressed, contained and concealed, or reframed into an alternative emotion through a shift of attention, posture, or position.

There is currently an enormous body of ongoing research on the science of emotion regulation. While much remains to be learned, there seems to be considerable support for these general concepts of the ways in which emotion regulation unfolds. (John; Gross) In addition there is much support for the concepts that emotion regulation is an inherent feature of emotion systems rather than a response to their activation (Thompson; Greenberg), and that the broad equilibrium-restoring approaches of sustain/express, contain/conceal, or shift/replace occur through both innate and learned pathways. (Gross) In other words both “bottom-up” influence on processing in, and “top-down” learning of emotion regulation by the neocortex are inherent features of emotion systems.

The learning of the meaning of emotion and of appropriate patterns of response to it involves the development of neural networks that extend connections between the innate emotional systems and the neocortex. Through such connections emotion becomes embedded in the content of memories. When a new experience is encountered, the brain searches for memories of previous experience with similar facets, and the emotional system associated with the memory

is activated. In response, sensory and appraisal processes become attuned to seek clues that are particularly salient to the emotional system involved. (Siegel) A simple personal example illustrates this phenomenon. When I was about ten, I left a pair of muddy shoes on the back porch. Several days later I picked them up and a very large spider crawled out of one of them and up my arm. I never wore those shoes again. More to the point is the impact of that trivial childhood event on my present life almost fifty years later. I keep a pair of gardening shoes in the garage. I almost never put them on without the memory of a huge spider intruding into my mind, and always give them a good shake to make sure there are no surprises inside. And even if I consciously try to laugh at my behavior, I still feel a noticeable pang of fearfulness as I put my feet into them. The likelihood of a creature inside is negligible, but my senses are primed by my fear system, activated by memory of that prior experience nonetheless.

Much of the life experience of young mammals is about the development and fine-tuning, through protected learning experiences, of these networks. This early-learning time is particularly important in the future trajectory of that learning because once neural networks are established they can become default pathways merely because they already exist. In other words a new experience is more likely to be channeled through a previously activated neural pathway because the pathway is already there. Furthermore, networks become stronger and more “automatic”, or in neurobiological terms more resonant, every time they are subsequently activated. In this way, early life experience can be particularly influential in what comes later. (Siegel)

The net result is this: because the mammalian brain seeks similarities to previous experience in new experience, our emotional systems can be primed to respond in ways that may not be entirely appropriate to the new circumstances. This is a point of particular relevance to a neurobiological perspective on the Enneagram. One of the things we know about our type is that we tend to see in a given situation what we are looking for. As a nine, I see discord and feel agitated in exactly the same circumstances where others might see clarity or feel energized.

The powerful human neocortex possesses phenomenal and probably unique abilities for cognitive reflection, symbolic abstraction, and the variety of other attributes

that are associated with human consciousness. Another aspect of these capacities is the ability to project past experiences into the future. For better or for worse, the powerful human neocortex can greatly complicate our emotional life by projecting old but not necessarily relevant emotional associations – and thereby skewed attention – into the present and the future.

In summary, our fundamental emotional systems play a pivotal role in shaping our early growth and development, and therefore our later adult experience. As we grow and develop we learn skills in regulating our emotions in ways that generally promote survival and effective social functioning. These bottom-up and top-down interactions which comprise emotion regulation are at the center of a neurobiologically plausible model of the Enneagram and the "habit of mind" or each type.

MAMMALIAN SYSTEMS OF EMOTION AND THE ENNEAGRAM

In the discussion which follows, I make the critical but highly plausible assumption that the bursts of emotional reactivity that we associate with the activation of our type structure arise from one the three major "alarm bell" emotional systems (which Panksepp labels FEAR, RAGE, or PANIC), and that these systems map directly and respectively to the head, body, and heart triads of the Enneagram. This assumption is based on the obvious congruence between classical Enneagram teachings about the three centers of intelligence, and what mammalian neurobiology, summarized earlier, teaches us about the focus and purposes of the FEAR, RAGE, and PANIC systems. I suggest that these systems form the bedrock of the patterns of reactivity associated with our type.

In order to fully appreciate how type might emerge from this bedrock of FEAR, RAGE, and PANIC, we must attempt to imagine life from the perspective of an infant or young child. In marked contrast to our experience of life as adults, early life experience is vastly more emotional than cognitive. In fact our innate FEAR, RAGE, and PANIC systems are functional at or shortly after birth, long before there is significant discernable learning or cognitive function. (Panksepp, 1998) It seems certain that emotion and associated feelings – notably feelings which lack substantial cognitive meaning – are prominent inner states in the life experiences of the infant and very young child. Feelings arising from the FEAR, RAGE, and PANIC almost

certainly begin with the traumatic upheavals of being born (if not before) and continue through the inevitable trials and tribulations of dependent early life. (Siegel)

So how and why might type emerge in this milieu? A completely plausible scenario begins with the emergence, during our emotion-centered early life, of one of the three "alarm bell" systems as particularly salient to our relationships with parents, caregivers, siblings, and early playmates. This could occur through well-characterized neurobiological processes, in the face of any of a vast number of combinations of constitution (i.e. temperament), nurturing, and the particulars of life circumstance. Regarding temperament, there is no doubt among either developmental psychologists or parents that newborn infants in the same family (even twins), can have very different temperaments. Indeed there is good evidence that infants exhibit temperamental differences *in utero* which persist following birth. Notably, there are models of temperament from the fields of psychology and behavioral genetics that identify three primary temperament styles characterized by fear, anger, and distress. (Buss) Similarly, it is obvious that nurturing and life experience provide ample opportunity for emergence of individual differences. From the moment of birth we must begin working for a living – for example we must make our basic needs for food and comfort known through primitive communication mechanisms. For better or for worse, however, even the very best of parents cannot always be present and attend to our every need and desire for protection, nurturance, and attention. In other words, emotional reactivity beginning in earliest life is inevitable.

From a neurobiological perspective, we are born with a brain that has innate emotional capacities and temperamental tendencies, but which must be "tuned" to and by our actual life experience. Our earliest life experiences lay down neural networks. As already described, the first networks are more likely to be activated and therefore reinforced (i.e. become more "resonant") by later experience simply because they are already laid down. With each episode of activation, they become increasingly more durable and resonant. In the process they also condition our attention to look for evidence that they will be activated.

Note that in positing that FEAR, RAGE, or PANIC become

particularly salient, we are not necessarily implying negligent or abusively inflicted trauma (although they may of course be present). Instead we are talking mostly about the inevitable, real-world trials and tribulations of early life and being parented. In fact it is probably essential that we not be completely coddled and protected so that our brains have opportunities to learn to regulate the uprisings of our fundamental emotional systems in socially functional and survivable ways. Within the broad limits of the "good enough" parent-child relationship, the physical and emotional bumps and bruises that we encounter in early life are probably required to train our brain. Among the most important things we must learn are basic skills of emotion regulation, so that we can navigate the terrain of negative emotion effectively in later life. In early life the parent-child relationship and our subsequent play relationships with siblings and playmates provide ideal incubators – sometimes crucibles – for developing these skills.

EMOTION REGULATION AND ENNEAGRAM TYPE

The core proposition of this paper is that the structure of each of the nine Enneagram types is built around a particular pattern of emotion regulation relating to FEAR, RAGE, or PANIC. These patterns emerge in early life as cognitive-emotional structures which reside in the neural networks responsible for emotion activation and regulation. The bad news is that our Enneagram "habits" are rooted in relatively primal emotion systems that govern the ways in which humans "deal with" negative emotion. The good news is that these systems can continue to learn and adapt throughout life, and that within the characteristics of each type is a fundamental skill set required for navigating our inner emotional terrain. Said another way, the Enneagram figure may represent a sort of schematic "wiring diagram" of functional cognitive-emotional structure in the domains of the major negative emotions in humans. Before briefly examining these larger implications, let us first look at the core proposition from the perspective of each of the three Enneagram triads.

FEAR and the Head Triad

As described earlier, FEAR exists to mobilize the body in the face of potential or imminent danger. FEAR broadcasts a signal that says "PAY ATTENTION! YOU DO NOT UNDERSTAND WHAT IS GOING ON HERE! YOU MAY BE IN DANGER! GET READY FOR ACTION!" Some objects of the FEAR response are inborn. For

example, mice born and reared in laboratories and never exposed to a cat react fearfully at the scent of one. Other objects are learned through life experience. Subsequently FEAR can be activated if a facet of current experience connects to a facet of that previous learned experience, even though the association may not be entirely rational. In the sophisticated and complex human brain, fear can also be activated by imaginary experience.

It is in the primal nature of FEAR that it is happening well before the rational brain has a chance to "make sense or understand". Indeed, a primary purpose of fear is to focus the rational brain on the immediately urgent task of making sense. It is also in the primal nature of fear that it pushes the animal to "DO SOMETHING (about this unpleasant inner experience I am having)".

What happens when the FEAR when the system is activated? First and foremost, attention is seized and directed toward the fearful object. At the same time regulation of the FEAR system in the most adaptive direction is initiated. We see the end result in the three points of the head triad. Point Six can be said to *sustain and manifest* a fundamentally fearful, doubtful, and preparing-for-the-unexpected stance; point Five to *suppress and conceal* expression of fear, instead taking cover, observing, and seeking to consciously understand and make sense (it is often better to conceal fear, e.g. from an opponent); and point Seven to *shift and reframe* fear, manifesting instead its opposite in the form of self-confidence and optimism, by directing attention away from fear and toward opportunity, whether escape or the bright side.

Why would a particular pattern become the "default mode" response to activation of FEAR? A biologically plausible explanation would require only two things: 1) the FEAR system would have to become particularly salient (compared to RAGE or PANIC) in the early life experience of the small child; and 2) a cognitive-emotional structure associated with either sustain/manifest, suppress/conceal, or reframe/shift would have to become more resonant than the others.

FEAR might become particularly salient for a small child if he were born with a temperamental tendency toward fearfulness, if a constellation of fearful experiences happened to occur at some sentinel point(s) in his

development, or most likely a combination of such nature and nurture events. Regardless of the particulars, an early neural fear network could be laid down and then become more and more highly resonant with new experiences through the kind of boot-strapping mechanisms previously discussed. Suffice it to say that the mechanisms by which the brain operates are such that under a variety of nature or nurture scenarios, it is quite possible that FEAR could become particularly salient, and that the child develops an underlying affective tone related to it.

Fundamentally similar mechanisms can also readily explain the later emergence of a particularly resonant cognitive-emotional structure associated with either sustain/manifest, suppress/conceal, or reframe/shift. This could occur simply because that particular pattern worked better and/or more often in helping to alleviate the aversive feelings of FEAR arising in his particularly salient and sensitive FEAR system. Alternatively, it could happen because it was rewarded and reinforced. For example, a young Six might receive parental praise for his cautiousness, or internal gratification when his projected fears proved well-founded (as some will inevitably be). The particular circumstances are not important. What is important is that one adaptive pattern becomes more durable and resonant than the others through a combination of nature and nurture, and in the process becomes a habitual response pattern for uprisings of FEAR.

RAGE and the Body Triad

As described earlier, the mammalian RAGE system is about ensuring freedom of movement, whether toward the satisfaction of important needs or desires or in the face of obstruction or entrapment. External agents that get in the way activate the system. In the wild such agents might include competitors or predators. In the course of even the best human childhood, they might include parents, and later siblings and playmates. The RAGE system can be activated when some facet of current experience connects to some facet of previous experience that was (or that was perceived to be) restraining or controlling, whether or not the association is entirely rational. In the sophisticated and complex human brain, anger can also be activated by projected or imaginary experience.

RAGE broadcasts an internal signal that shouts “GET BIG! GO FOR WHAT YOU WANT AND NEED! HAVE YOUR WAY! YOU ARE THE

POWER HERE!" It is in the nature of RAGE that it is flowing through the body before the rational brain has fully assessed the situation at hand. The basic primal responses of RAGE are focused on pursuing needs or desires, power, and protecting the physical body. This energy fuels movement and action in service of needs and desires.

As with FEAR we see in the Enneagram's body triad three distinct approaches to regulation of the emotions of the RAGE system. Point Eight tends to *sustain and manifest* the attributes of RAGE ("I am big and will get what I need"); point One tends to *suppress and conceal* manifestations of RAGE ("it is not safe or right for me to be angry"); and point Nine tends to *reframe and shift* RAGE (e.g. by shifting attention to <u>you,</u> my wants and needs become less important and my anger subsides).

The RAGE system might become particularly salient in the early life of a child for any of a number of reasons. She might have an inborn temperamental predisposition. Alternatively at some critical juncture(s) in development (or on average over time) she might experience her parents, siblings, or playmates as domineering, limiting, or "pushy". Under these or other such life circumstances the RAGE system could become primed for response, and an affective undertone of alertness to signals of limitation or provocation would naturally arise. Then, in the absence of serious social dysfunction, one of the basic regulatory approaches would become stronger than the other two simply because it "worked" more often, or because it was reinforced by external (e.g. parental) reward. My younger brother (point Eight) got a lot of what he wanted while growing up by sheer force of will (at least that is how it seemed to me), while I (point Nine) received a lot of gratifying psychic reward for being such a nice, good little boy. Whether nature or nurture (or most likely about equal combinations of both), the neurobiology is similar to that described for FEAR. In this case, however, RAGE becomes particularly salient; the senses are therefore tuned to seek that which might trigger RAGE; and the specific adaptive response that develops is most likely to be the one that was most used and/or most successful in previous life experience. The emotional component is RAGE. The patterns of adaptive response are learned and include most of what we identify as the characteristic habits of the body types.

PANIC and the Heart Triad

As in the case of FEAR and RAGE, it is important to attempt to think about the PANIC system from the perspective of an infant or very young child. The first and foremost function of the PANIC system is to assure maintenance of connection to caregivers. In the case of the very young infant, this connection is literally essential to survival and the maintenance of life, and the panic system is activated at the perception of disruption of connection. The resulting cry of separation distress is designed to arouse the CARE system of the parents. The parental CARE system functions in a back-and-forth dynamic with the infant's PANIC system. PANIC activates CARE which soothes PANIC and brings comfort and serenity to both the recipient and the giver of care. Interpersonal relationships in later life are built on the emotional and adaptive response platform established in these dynamics of early life.

PANIC broadcasts an internal signal that shouts "YOU HAVE LOST CONNECTION!! MAKE YOURSELF SEEN AND HEARD BECAUSE YOU NEED CARE AND ATTENTION!!" At the same time regulatory mechanisms to restore emotional equilibrium are activated. We seem them reflected and expressed in the Enneagram's heart triad. Point Four can be seen as *sustaining and manifesting* the attributes of PANIC (i.e. outwardly expressing feelings of loss of connection); point Three as *suppressing and concealing* expression of PANIC; and point Two as *reframing and shifting* the expression of PANIC (e.g., by shifting attention to the other's needs for care (which in and of itself is comforting), CARE and reassurance are attracted.

From a neurobiological perspective the dynamics by which these patterns might become established are identical to those underlying the other two triads. Thus a child might be born with a strong temperamental tendency toward the need for care and attention. Or he might have experienced his parents as inattentive to his "distress calls" or otherwise uncaring at some critical juncture(s) in his development. Under these or other such circumstances an underlying affective tone emerging from PANIC would call his attention to the amount of attention others are giving him. He would naturally (and mostly non-consciously at first) try various approaches to attract their attention. Eventually, through learning and repeated experience, one pattern would emerge because it worked best or was rewarded (in this case with attention), either at some seminal

event(s) or on average over the course of time. Through learning and the establishment of resonant neural networks, one of three basic patterns of self-regulation of the emotion emerging from PANIC would become most resonant in neurobiological terms – or habitual in Enneagram terms.

In summary, the hypothesis developed here is that the FEAR system for the head triad, the RAGE system for the body triad, or the PANIC system for the heart triad become primed for reactivity in early life. This occurs because that system was particularly salient during the experience of early life, and became particularly resonant in neural networks of emotion regulation. As a result attention becomes "automatically" directed toward those facets of experience which resonate with previous emotionally-charged experience. When the resonant network is activated, a burst of negative emotion is triggered which, by its nature, says "DO SOMETHING!" That something falls into one of three basic emotion regulation patterns: sustain/manifest, contain/conceal, or shift/reframe. The default response pattern is the one which became most strongly resonant, through life experience and learning, in neural networks responsible for emotion regulation.

It is interesting to note that this view suggests the possibility that the three Enneagram types associated with each triad represent nodes of a well-functioning emotion regulation framework. Depending on the circumstances at hand, we need facility in moving between the three approaches to determine how to best "deal with" the feelings arising from FEAR, RAGE, or PANIC. Viewed in this way each type may be seen to represent a fundamental skill set needed for successful navigation of our inner emotional terrain.

Additional Thoughts About Negative and Positive Emotion

This paper has focused on the hypothesis that Enneagram type structure is built on a foundation of specific patterns of regulation of negative emotion. That this is so is certainly consistent with our inner experience of type activation (if we are attentive to our inner state). Moreover, there is considerable evidence in the psychological literature that adults pay more attention to and learn more from negative emotion than positive. As persuasively argued in a recent theoretical paper in the emotion regulation literature, there is every reason to believe that this "negativity bias" also prevails in early

development. (Vaish)

What role might positive emotions and emotion systems play? For now I offer a few, mostly speculative thoughts. It seems most likely that positive emotions provide the current, the "juice" that motivates us toward the variety of wants, needs, desires, goals, and activities that constitute our lot as human beings. A good example is Panksepp's SEEKING system. It is harnessed by brain systems governing many different needs, and drives behavior toward satisfaction of them. In a similar way PLAY moves us out into the world and, in the process, into learning about the world and our selves. Whether there are more specific relationships between certain types and positive emotional systems requires further exploration. For example, how does the shift of attention that accompanies the reframing of type relate to the PLAY system; how does the type three pattern of contain/conceal relate to SEEKING or PLAY which inevitably separate us from CARE; is the body center really about the constant interplay of SEEKING and frustration of need satisfaction? It would be interesting to explore these questions in narrative inquiry panels.

CONCLUDING THOUGHTS

This hypothetical model for the neurobiological origins of type structure is entirely consonant with classical Enneagram teachings, which place considerable importance on intercepting the internal, felt sense of "energy" that kick starts the habitual patterns of thinking and acting that constitute type. It also explains why our experience of type being activated feels like it does. We come into the world with hard-wired systems for dealing with archetypal concerns and threats. By design rapid, immediate, and pre-conscious response is characteristic of their functioning. In this sense the negative emotional systems are innate and primal, but to be functional they must be taught and tuned by our real life experience. And the experience that matters most is the experience of early life, when our inner experience is dominated by the ebb and flow of emotion, and our blank-slate learning brains are laying down the first neural pathways of functional learning.

Nor is it any wonder that we all know the experience of the train of our type having left the station with us aboard for the ride, even after years of Enneagram work. The particular emotional system corresponding to our triad is both primal and primed for response. When some facet of a

new experience suggests an association with previous emotionally charged experience, attention automatically begins scanning selectively for evidence that "fits", and tells us that we need to DO SOMETHING. This is all exactly as the systems evolved to ensure.

The good news is that neurobiology provides abundant insight into the processes of growth that take place as we begin to work seriously with our type, and gives us good reason to pursue this hard work. In learning to bring these powerful, rapid, primal emotional signals to conscious awareness, and in following other than our habitual paths of reaction, we actually create new neural circuits that, with practice and repeated use, establish in our biological wiring an expanded, more varied, and more nuanced repertoire of emotional and behavioral response. The neurobiological term for this process is "neuroplasticity", and there is now abundant evidence that our brains remain "plastic" and eminently teachable until we die. (Siegel)

I find it extremely satisfying that there is plausible science beneath virtually everything we learn in working with the Enneagram. The convergence of two entirely separate paths of inquiry into the nature of human experience, one based in science and the other in narrative holistic inquiry, lends considerable credibility to both. I also find greater clarity in a view of the Enneagram informed by neuroscience. The adult human account of emotional experience – which is the primary source for most of what we know about the undercurrents of emotion beneath our type structure – is always tangled with more or less relevant neocortical overlay. Looking at the Enneagram triads through the relatively clearer lens of neurobiological science and animal models helps me parse the emotional energy and mental habits that constitute type.

Perhaps most important, I am able to feel more compassion – for myself as well as others – when I think of type in this way. For example, an account of the body types as being rooted most deeply in emotional reaction to a sense of restraint or thwarting of the pursuit of needs and desires rings more clearly to my life experience than the much more complicated (and to be honest, often confusing) phenomenon we call "anger" in Enneagram circles. Similarly it has helped me to understand the emotional dimensions of the other two triads, and to hold more compassion for them. The

heart triad becomes clearer when I see it as grounded in the innate system for monitoring our primal human need for connection and mirroring. Similarly, the head triad makes more sense when viewed as grounded in a burst of emotion that says "ATTENTION…SOMETHING DOES NOT MAKE SENSE".

I also believe that viewing the Enneagram from a scientific perspective will facilitate wider interest in collaborative dialogue and inquiry with the psychological and neuroscience mainstream. If nothing else, translating traditional Enneagram concepts and language into "mainstream" concepts and language will help bridge a large communication gap. This is important because the Enneagram has a lot to contribute to contemporary psychology and neuroscience. All of us in the Enneagram community know this from the perspective of our work applying it to personal and psychological growth, both our own and our clients', but there are other reasons. First, contemporary psychology lacks a coherent and comprehensive model of personality across the life span. The Enneagram may well provide it. Second, the Enneagram may provide important insight into the ways in which various brain systems interact with each other. As it provides us with a map for personal work, it may also provide science with a plausible model for the ways in which various systems of emotion, often studied (necessarily) in relative isolation, relate to and interact with each other.

There is a lot more to be said about and developed around this model and perspective. For now suffice it to say that the workings of the Enneagram seem to have emerged in the course of evolution as a cardinal feature of human consciousness, and that the system may be central to our evolutionary success as a species (at least to date). In other words evolution may have selected these nine patterns because they work in making us a successful species. Moreover, it is quite possible that our innately social species requires the variety of different types for its collective success. If this is so (and I see no other plausible explanation for the fact that type appears to be a universal attribute of humans), there are profoundly important implications for the future of humanity and human consciousness. We are the possessors of human consciousness, but also its custodians. We have the extraordinary opportunity to nurture it by better understanding and by developing ourselves as a social species in ways that capitalize on assets, mitigate

limitations, and embrace the diversity of the Enneagram.

My primary goal in introducing this work-in-progress is to set out the basic cornerstone ideas of a neurobiological foundation for the Enneagram, and to engage the broader Enneagram community in a reality-checking dialogue about them. After all, as both a scientist and as a student of the Enneagram I am acutely aware of the possibility that I have clearly seen what I was looking for…and neglected the rest. I welcome thoughts, questions, and criticisms of these ideas, and look forward to the opportunity to use that material to further shape and refine them.

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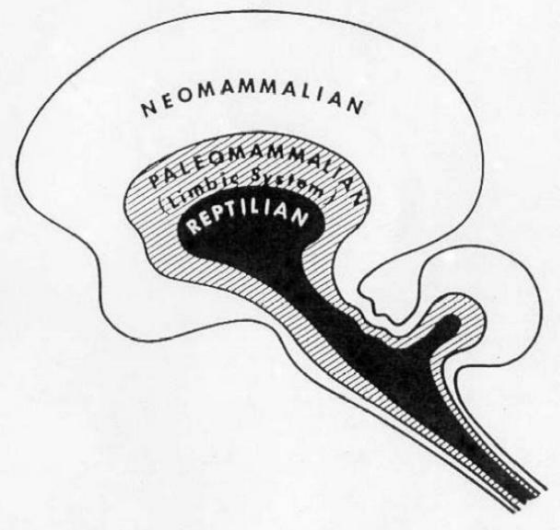

Figure 1: MacLean's triune brain - a schematic diagram
(Image from www.uwf.edu.jgould.triunebrain.pdf)

Figure 2: The mammalian mother-infant bond in operation.
(Image from www.babyanimalz.com)