
USING EVOLUTIONARY PSYCHOLOGY AND INFORMATION SYSTEMS ENGINEERING TO UNDERSTAND WORKPLACE PATTERNS OF THOUGHT AND BEHAVIOR

AN EMPIRICAL MODEL OF HUMAN INFORMATION PROCESSING

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Abstract

Evolutionary psychology and information systems analysis are combined to form an empirical model of human thought and behavior. The process of natural selection appears to define specific system requirements for all animals, which of course includes human beings. Through a comparison of these naturally defined system requirements to the behaviors of animals and humans, a four component information processing system in human beings is identified. The human model exhibits critical advancements over animals specifically in the rise of customizable Drive Satisfaction Strategies, a consequence of human symbol manipulation and problem solving capabilities. The key interpretive power of this model lies in the concept of system collisions between the four components composing the human information processing system. System collisions in this model can be used to explain many good, bad, and puzzling features of human experience.

The Lack of a Model of Human Behavior

A NUMBER OF SUPERFICIAL DESCRIPTIONS of human thought and behavior appear to be used in industry to help predict a person's chances of success in a given company, but they do not provide much better information than traditional horoscopes. Most of these products have found what appear to be fairly stable correlations between carefully crafted question sets and what are called "personality types," yet they really do not seem to provide any reasons why these correlations appear, and what they really mean. Furthermore, like a freshman working through his or her first developmental psych course, it is easy for people using

these tools to blindly accept that they are what the correlative description says they are.

Until recently the clinical psychology situation was not much better. Most practice in clinical psychology was based on theory built on studies of pathological populations. As recently as the early 1980s there was no practical clinical psychology based on the study of mentally healthy populations.

From the practical standpoint of things like business productivity and job satisfaction, there has been no place to go to build management tools or worker training programs to optimize the strengths of the human mind for various working conditions. Something resembling a comprehensive theory of human thought and behavior that leads to practical models is yet to be found.

Common human experience and anecdotal evidence suggest the following questions:

- Why do negative psychological experiences tend to persist, while pleasant psychological experiences tend to be transient?
- Why do successful people often continue to experience negative psychological states with respect to their professional environments?
- What value, if any, do negative psychological states without an identifiable cause have?
- Why do our emotions keep us from acting in ways that logic clearly demonstrates are better for us?
- Why do some groups generate collaborative habits among their members, but most groups generate competitive habits?
- Why do incompetent people often rise in organizations, and why do more competent people put up with this phenomenon?
- Why is it that spiritual pursuits are virtually ubiquitous among all human cultures, and why do they persist among populations where training in hard science and technology is common?
- Why do some business leaders operate at nearly criminal levels with no sense of responsibility while others are scrupulous to a fault and riddled with worry?

These puzzles are not well posed as scientific questions. They all contain more than one variable. Some of them imply a scale going from some “good” point to some “bad” point. Furthermore, while one could argue that these observations are related, the connections are not obvious.

Those who are familiar with the methods employed in the physical sciences know that scientists would prefer to approach a set of questions like these from “first principles,” and derive an answer for each of these questions from a broadly accepted “standard model.” In the absence of a standard theoretical framework, physical scientists will attempt to construct an empirical model which at least comprehensively describes the collection of observations as a related whole.

If an empirical model can be constructed, then a community of scientists can iterate on a cycle of steps between hypothetical “guesses” and a variety of tests that the guesses suggest. The scientists run the tests, and revise the guesses until experimental work and theoretical work converge. The best hypothetical frameworks will actually predict the existence of other related phenomena heretofore unobserved. If these predicted phenomena are uncovered, the strength of the model is considered quite good.

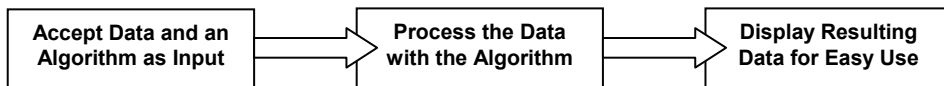
Are there ideas available that could help a scientist construct some kind of practical model of human thought and behavior?

Piecing Together the Basis of a Model

A Working Perspective: Biological Systems as Information Processing Systems

Semi-popular literature is full of statements about the information carrying power of DNA, and the ability of various other molecules to use this information as a source of complex instructions. Research in biochemistry gives clear indications that viewing a biological system as embodying one or more sophisticated information handling systems is perfectly valid.

This means that some form of objective, empirical model of human thought and behavior might be achievable. Information systems are open to various forms of study based on fairly simple principles. In its most basic form an information system has to do three things:



These three-step chains can be formed into loops, decision trees, and any of a large variety of complex control processes by an information engineer.

It is possible, in principle, to apply information system analysis methods to human thought and behavior in order to map the system as it currently operates. We will apply an information engineering method called “reverse engineering” to generate that map.

Natural Selection: “Provider” of the System Requirements

Biological information processing systems persist only as they deliver the ability to play the game of natural selection to an individual organism. System changes are judged by how well they improve an individual organism’s reproductive capabilities relative to other competitors in the immediate environment, and in the ability to deal with the conditions presented by the environment itself.

In the Earth’s ecosystem there are two separate, independent processes that govern the change of species with time. The first process is the completely random process of physical change of an offspring when compared to parents, brought about by random genetic changes. These random changes can range anywhere from a catastrophic birth defect to a change in physical appearance found more desirable by the opposite sex. The second process is the chaotic operation of the environment that determines if this genetic change will persist past its initial appearance, and if so, how fast it will spread throughout a given population of related organisms. This second process is what should be thought of as “natural selection.”

The most simple criterion to judge an organism’s success in the game of natural selection is to count not only how many offspring an organism has, but also how many “grandchildren” an organism has. This demonstrates that the change actually delivers “advantage,” the key to winning at natural selection.

There are several ways to hit the needed numbers.

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- You can have large litters so that mortality rates don't hinder success.
 - You can live longer to generate more litters.
 - You can protect and train offspring to assure the reproductive success of the offspring when their turn comes.

These bullets suggest a number of system requirements around which to develop a successful information processing system for living organisms. Stated in plain terms, these general system requirements might look like this.

- The system must support the needed reproductive behaviors.
- The system must support the needed survival behaviors.
- The system might optionally support the protection and training of the young.

These give us a clue as to what to look for when attempting to map human information processing systems.

*Evolutionary Psychology: The Last Component
of our Inter-Disciplinary Synthesis*

Roughly twenty years ago a group of scholars attempted to apply the principles of natural selection to an understanding of animal behavior, with special emphasis on human studies. The parents of this field are generally considered to be Leda Cosmides and John Tooby of the Center for Evolutionary Psychology of the University of California, Santa Barbara. A comprehensive primer on evolutionary psychology can be found at the Center's website, www.psych.ucsb.edu/research/cep/.

A general idea from this field that we accept is that not only do physical structures like arms, legs, and teeth change over time, or even physical structures in the brain for that matter. In information engineering terms, the "software" run by animals in their endocrine systems and their nervous systems also changes over time. This is the most basic concept of evolutionary psychology.

In addition to this broad philosophical perspective, evolutionary psychology also provides (or has adapted, depending on the scholar) a

specific concept that we have found particularly useful in interpreting many features and puzzling characteristics of human thought and behavior. This concept is called the Environment of Evolutionary Adaptedness (EEA). The idea, most simply stated, is this: *There is a hypothetical ideal place and time for which an organism's features are best suited.* This concept is merely a convenient idealization. It is not meant to link a given animal's features to a real time and place in natural history, although some students actually attempt to do this. It is instead to say in general terms, or in a statistical sense, that in the natural history of a given species they most likely were best suited to "some region of the world X at some given epoch Y."

In our research we expand on this concept in a very specific way. Instead of generalizing an EEA for a species, we assert that there is an EEA for any given major system or organ in an animal body. This means that different parts of an animal, or different systems within the animal, are differentially better suited to various times and places in the natural history of their phylogenetic tree. For practical applications to human beings in post-industrial societies, it means that most of their body parts and systems are better suited to living outside in the grassy woodlands of Africa than they are to working in acres of Dilbert Cubes in some 20-floor business high-rise.

Fabricating the Model of Information Processing Systems in Human Bodies

As stated previously, a physical scientist would prefer to work with a commonly accepted standard model from which all observable phenomena could be described and explained. We don't have that for animal information processing. However, as we attempt to construct such a model, we should keep the whole animal kingdom in mind, and not unduly truncate the data set simply to human thought and behavior. In fact, we must make use of large segments of the animal kingdom to begin fabricating our model. After all, each species of animal has much natural history in common with all others, and closely related animals, like chimpanzees, bonobos, baboons, gorillas and humans carry an even larger number of related traits among them.

First, let's examine animal behavior in general to identify information system requirements in action. What form do the bullets we wrote out two sections back take in real world settings?

Animal Drives: Operationalized System Requirements

The temptation when observing anything is to anthropomorphize the subject being studied. We need to flip this around and start out by "animalizing" our own self-perceptions. We think of life in terms of survival, reproduction, nurturing, working and lastly dying. If animals can be said to think at all, they are not thinking about life in these terms.

For instance, even among mammals it is very difficult to determine with any certainty that animals are aware of an abstract concept like death. We as humans don't think it's abstract...we think of it as a terminally undesirable fact, and of course it is. But animal information systems are not built to handle life on that basis.

Reverse engineering applied to animals in general indicates that animals are very "concerned" with comfort and pain. Comfort is achieved when pain is eliminated, or even avoided. This could involve things like hunger or thirst, heat or cold, or obvious danger, as in a threat of attack by some predatory animal nearby. Large numbers of feedback loops are engineered into animals to handle changes in these conditions.

There are no informational feedback loops relative to death. Information processing stops, so there is no need for drives which carry on after death. While it seems to be the case that some larger mammals recognize a change of condition when members of their own kind die, most of the millions of the world's species are completely clueless about death.

This helps us draft our first, naturally selected system requirement for animals as

- The drive to eliminate or avoid all forms of pain or discomfort.

A similar kind of reasoning helps us to understand behaviors that lead to reproduction. As a rule animals don't ponder their desires for a child. They simply follow the biological signals that initiate the selection of mates, make the selection, and have sex.

Lest we take too high-minded a view of human reproduction, I'd like to remind those old enough to remember about the Sexual Revolution of the

1960s and 1970s. If there was ever anything clearly about sex and not reproduction, it was the Sexual Revolution. I rest my case. This allows us to draft our second naturally selected system requirement as simply:

- The drive to have sex.

Finally, large mammals have a peculiar reproductive strategy when compared to most other animals. Most large mammals have small litters where one offspring being born at a time is common, and twins or other multiple births less common. Where most species of the animal kingdom generate huge numbers of offspring that can withstand huge number losses, mammals have to take extreme care of the one or few new offspring they generate.

This means that various forms of parenting skills need to be programmed into these animals. In wild conditions, raising offspring is a hazard to the parents. Offspring are a drain on resources, reducing a parent animal's ability to take care of itself. Offspring also attract other dangers, and are difficult to defend. So, it's in the parents' best interest to act according to naturally selected drive number three, which is

- The drive to nurture offspring to self-sufficiency in the shortest time possible.

The System Architecture of Human Information Processing

Evolved systems tend to retain various features from their past. This is particularly true of systems like those we find in the animal kingdom. Circulatory systems are found in virtually all animals. True brains and nerves are found in many of them. We humans even retain the needed bones for a tail.

We can therefore expect to find system components in animal bodies of various "evolutionary ages." Such evolved systems are also frequently found in old financial services organizations. Here is a caricature of such a situation. We can think about human information processing systems as about as well put together as a computer that has one subsystem built out of tubes from the 1950s, another one using printed circuit boards from the 1960s, and another built out of microchips from the 1990s. You can get it to work, but it isn't pretty.

As we proceed with this system modeling process, please keep in mind that this process connects neither with the genetics of an individual, nor

the specific structures in the human brain and nervous system. This is because the environment within which these systems operate “places no value” on the mechanisms an organism might use to survive, other than that those mechanisms deliver success in the game of natural selection. So there will be no attempt to map the systems we will describe below to specific parts of the brain, or various groups of genes or genetic processes. Reverse engineering in information sciences has little primary interest in absolute forensics. It is usually used only in an attempt to map out functionality in a system, and if possible, determine some of the basic assumptions behind the system’s design.

Based on an examination of the animal kingdom in general, and the human species in particular, we find that information is handled with the following, four-system architecture.*

1. Chemical based information processing, around 550 million years ago.

We time tag the EEA of chemical-based information processing in animals to 550 million years ago because this is when all of the various levels of chemical driven information sharing and various instruction sets become organized into a hierarchy. This hierarchy persists in most (if not all) animals known in the present time. Circulatory and endocrine systems became common features in animals about 550 million years ago. The primary aim of these is to assure that, in multi-cellular life, enough information gets delivered to primitive cells and tissues so that they remain alive. Of course, chemical based information processing *per se* originally appeared when the first uni-cellular life forms appeared.

2. Sense and response systems, around 350 million years ago.

Primitive sensory systems also appeared in earlier animals, but at this point in time the configuration of senses on the head became common. This facilitated the search for life-sustaining resources, and provided advanced warning of dangers.

As we know from modern sensing technology, sensory apparatus requires a great deal of information processing capability to generate useful data out of the stimuli they detect. Sensory data processing in humans includes color coding of the various wavelengths of light that the eyes detect (not to mention intensity scaling), pitch coding for various frequencies of sound that the ears detect (not to mention volume scaling), and all kinds of interpretive cues for chemicals entering the nose. There is also a lot of resolution and contrast enhancement built into eyes and ears

themselves, which preprocesses a lot of signals before they get to the brain.

In addition to signal processing, many of the detected stimuli triggered specific, all or nothing responses within an organism. This is why response systems are included here. There is a tuning of responses to detected changes in the environment facilitated by natural selection. Given the EEA of this system at 350 million years ago, and that some of these tunings probably persist in human animals, it is possible that some classes of sensory stimulation, or perhaps the lack thereof, could trigger unexpected responses.

3. Environment condition alerts, or emotions, suited to the needs of large mammals, around 50 million years ago.

It is difficult to gain a full understanding of the properties of this system because our experience of it is extremely compelling. For most people it remains the primary source of guidance in the way they deal with their environments. Yet, our reverse engineering exercise gives us a few clues.

Emotions are actually a by-product of the chemical information processing system. For instance, when the senses pick up various changes in the environment, certain glands respond by secreting signaling chemicals that cause other glands and tissues to add strength and energy enhancing chemicals into the bloodstream. This gives the muscles additional power, if needed. These chemical changes in the bloodstream also create changes in the nervous system, which we perceive as an emotion. They add a perception of urgency with respect to the change our senses have observed.

In other instances, chemical changes occur in the body simply because we need refueling or additional water. Our perceptions of hunger or thirst usually start out fairly benignly, but if we don't take care of the need, our emotional responses to hunger and thirst become increasingly anxious. In extreme cases we can achieve high levels of desperation.

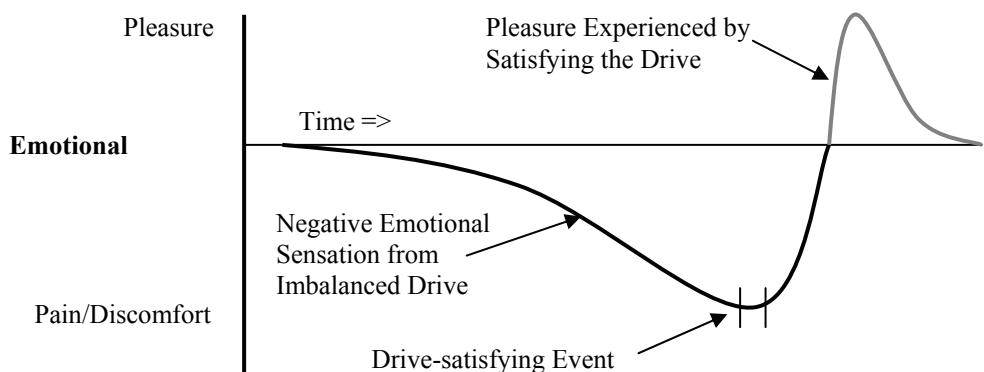
On the flip side, when we take care of hunger or thirst, the flavors are usually very satisfying. Or, if the environment presents some form of danger, which we subsequently avoid, we obtain an enjoyable sense of relief.

Collectively, we call these various functions "condition alerts." These condition alerts relate back directly to the three primary drives that

function as system requirements in human information processing. Emotions alert us to threats and opportunities in the environment, and depending on the size of the threat or opportunity, the emotional signal scales accordingly. From the management of resources within our bodies, emotions alert us as to how badly out of balance our chemical composition is and motivate us to take appropriate action. The greater the extremes we feel in terms of hunger, thirst, heat, cold, or other conditions that pertain directly to regulating body functions, the more desperately we act to return the conditions to their balanced state. Lastly, then, our emotions are also designed to reward us when we successfully achieve what our drives demand. Food and water taste extremely good to those who are hungry and thirsty. A sex-starved individual can find the beauty in any potential mate. A person who survives a 200 foot, 90 mile per hour slide down a roller coaster achieves an enjoyably huge sense of relief immediately after that great drop.

The figure below graphs out how emotions change when a drive goes out of balance. We observe that a person's awareness of an unpleasant emotion grows with time as long as the drive remains out of balance. However, if a drive-satisfying event occurs, not only does the negative emotional sensation go away, but it is almost immediately replaced with a positive, though short-lived, emotional experience in reward of rebalancing the drive.

Emotion-intensity Curve Signaling an Imbalanced, Basic Animal Drive



What is particularly interesting here is that if there are no drives out of balance, one should expect that an individual organism's emotional

experience re-aligns to the emotionally neutral position on the graph. Emotional neutral is the indicator that the organism's environment presents no threats or opportunities, and that its body's chemistry is balanced within acceptable design specifications.

This has great implications for societies where positive emotions are thought of as the norm for everyday, minute by minute existence. Various forms of pop-culture, including all forms of self-help training, explicitly or implicitly suggest that feeling good, especially about one's self, is some form of birth-right for "children of a universe that loves you." Our exercise in reverse engineering of human information processing does not support that position. The system is designed to achieve emotional neutrality in service to natural drives that need to be in balance if an organism is going to win at the game of natural selection. But we digress.

We set the EEA for this system of condition assessments at 50 million years ago. This is when large mammals firmly established their dominance in the gap left by the dinosaurs some 15 million years earlier. Reverse engineering indicates that this system provides improved drive satisfaction capabilities in two ways.

First, the special reproductive strategies virtually unique to large mammals (as described previously) require different sets of motivations, which collectively could be called "love." A large mammal parent frequently needs to set aside a wide spectrum of its own drive satisfaction issues for the sake of its offspring. If a parent cannot get its offspring to self-sufficiency, it has lost the game of natural selection.

Second, good threat assessment software supports energy conservation. Responding in an all-or-nothing manner to every change an animal detects in the environment is extremely inefficient. Mapping the level of effort accurately to meet the conditions imposed by the change is greatly facilitated by good assessments. As long as these emotional signals are accurately tuned to current living conditions, they provide positive support to the animal's drive satisfaction behaviors.

4. Problem-solving systems and input/output subsystems, around 1 million years ago.

We assign an EEA of around 1 million years ago because there is enough evidence to believe that primitive humans at that time were engaging their environment on a very different basis when compared to

other members of the animal kingdom. They were customizing materials they could find into tools used in drive satisfaction activities.

From an information processing standpoint, this collection of problem solving behaviors provides greatly expanded drive satisfaction capabilities. The primary reason for this is that they deliver classes of information management that do not appear to have analogs elsewhere in the animal kingdom, such as:

- Symbol-based information coding
- Information storage and retrieval based on symbol management
- Creation of symbol-based models that could be altered to test possible outcomes

These advances create at least two fundamental shifts in human approaches to drive satisfaction. Philosophically (so to speak), humans leave the ranks of animals, which are merely competing against each other in the game of natural selection, and begin to compete directly against the environment as such. This is what opens so many formerly uninhabitable (or rapidly changing, from a geological perspective) niches to human habitation. This is the correct meaning of adaptation in the animal kingdom. On a more practical level, these advances open up the possibility of drive satisfaction collaboration on a systematic level. As larger and larger groups come to agree on the meanings of symbols used by leading individuals to formulate their drive satisfaction strategies, larger numbers of individuals can team up for solutions requiring the strength or skills of more than one individual.

Customizable Drive Satisfaction Strategies

The primary reason animal information processing systems exist is to provide a platform which supports an individual organism's Drive Satisfaction Strategy (DSS). This is not to imply that any given animal plans, designs and executes a DSS. Rather, as automatons, animals acquire "software" that embodies a set of approaches for succeeding in the game of natural selection. For virtually every species except *homo sapiens*, DSSs are hard wired and hard coded sets of instinctive behavior.

The vast majority of behaviors executed by human beings are also driven by instinct. After all, the only system which differentiates the human being from other mammals is the problem-solving system, and that

one is barely out of beta testing: it's still very buggy. But as immature as this new system is, it still offers humans the option of customizing the approaches they take to drive satisfaction.

Our problem-solving system provides a user interface, which we have dubbed the "inner dialog." The term "inner dialog" isn't new, and it also appears in psychology literature with other names like "inner monolog" and "self-talk." It functions as our verbal white board, allowing us a place to manipulate various symbols as we puzzle out solutions to our problems. If verbal manipulation isn't adequate we have an extremely wide range of other symbol sets to help us develop solutions, like graphics, mathematics and so forth.

The inner dialog is quite well suited to managing symbols, and creating new ones as needed. What it isn't so well suited to is understanding non-symbol-based signals coming from the other three information processing systems in our bodies. This includes signals coming from changes in body chemistry. This includes sensory inputs that don't make sense to sensory pre-processors. This includes many emotional responses, especially those that do not appear to have an obvious cause in our surroundings.

The inner dialog appears to generate and manage what we call a "worldview." This is meant to be taken as a technical term denoting a human being's collection of observations, models, and attempted solutions, which support what should be an increasingly successful DSS.

This combination of DSS, inner dialog and worldview is used to design behavioral habits, which function as customizable instincts. As the human being's conditions change it is capable of puzzling out new solutions to deal with them. The successful solutions can be turned into habits if they are rehearsed frequently enough. Obviously, this allows a human to retune behaviors to external conditions as needed in a very short period of time. Instead of "waiting on" ages of slow physical change based on natural selection, human beings can adapt immediately and directly to new or changing environmental conditions.

At this point we can now summarize our model.

Basic Animal Drives, or Biological Information System Requirements

The drive to eliminate or avoid all forms of pain or discomfort.

The drive to have sex.

The drive to nurture offspring to self-sufficiency in the shortest time possible.

The Four System Architecture of Human Information Processing

System Name	Information Functions Supported
Chemical-based Information Processing (EEA ca. 550 million years ago)	<ul style="list-style-type: none"> • Static DSS • Status of biochemical balances • Status of hydration • Thermal regulation • Inter-organ coordination • Hosts the nervous system
Sensory/Response System (EEA ca. 350 million years ago)	<ul style="list-style-type: none"> • Static DSS • Positional information (organism location, location of resources, location of threats) • Resource detection • Threat detection • Damage detection • Pre-coded, targeted behavioral instructions
Condition Alert System (emotional responses to threats, opportunities, and successful drive satisfaction) (EEA ca. 50 million years ago)	<ul style="list-style-type: none"> • Static DSS • Adjusts alerts to include needs of offspring if present • Adjusts responses to changes in the environment to suit severity of conditions • Rewards organism for successful drive rebalancing behaviors
Problem-solving system (EEA ca. 1 million years ago)	<ul style="list-style-type: none"> • Customizable DSS • Inner dialog/user interface • Information-solution database/worldview • Symbol fabrication/manipulation • Symbol storage and retrieval • Model fabrication/manipulation

System Collisions, and their Impact on Human Thought and Behavior

We now have an untested model of human information processing in hand. We have said that the four separate information handling systems come from widely separated natural histories and conditions, that is, each of these four systems has its own Environment of Evolutionary Adaptedness. Yet, all four of these systems are built upon the same three system requirements.

That means all four systems are actually trying to do the same job, but they do it in four vastly different ways. Those readers who have had the privilege of integrating a computer system with components whose origins are scattered across technological space and time know that extremely troublesome system conflicts and collisions arise under such conditions.

This state of affairs exists in the human system as well. The most frequent and deleterious of these conflicts usually arise between our condition alert system (experienced in the inner dialog as emotions) and our problem-solving system. For a few simply stated examples, we all know the real benefits of going to the dentist, but fear of pain in the chair helps us to put off going. Or, most everyone knows substance abuse is bad, but the artificial inducement of a pleasure sensation, giving a false signal that a drive has been rebalanced, remains seductive.

These system collisions also have a lot to do with formerly inexplicable things, such as why single achievements do not pay off in lasting happiness. We set expectations on events that they simply cannot fulfill because our information handling systems don't support lasting happiness. System collisions provide great explanatory potential in understanding the odd quirks and frustrations that even a good life presents.

Other Implications/Applications

The concept of the EEA suggests that people who live and work indoors and don't get enough physical activity might suffer various psychological effects. A large number of control loops in a human body might be expecting vast amounts of sensory data from natural environments, and a lack of such signals might trigger a variety of psychological stresses. Or in an extreme case, what happens to people psychologically on extremely long space flights?

Similar feedback loops between the condition alert system and the problem-solving system might set up resonance-like phenomenon, where evaluations formulated by the problem-solving system create unneeded negative responses by the condition alert system, which then change the focus of the problem-solving system, and so forth. Such loops could escalate into conditions of depression, or in other cases, conditions of panic.

On the positive side, the inner dialog, worldview and Drive Satisfaction Strategy are reprogrammable (through education, training, or even a variety of conversion experiences). Can they be personally re-engineered to deflect the psychological effects of that large, obsolete catalog of condition alerts that are designed for life several million years ago, and make life today more comfortable, emotionally speaking?

Conclusions

We have attempted to build a model of human information processing systems. We are going to treat this model as our “practical psychological” framework. The eventual aim of this model is to be able to fashion training that optimizes the use of human information processing in knowledge-based work places. There may also be spill over advantages to use it in developing other personal disciplines to improve everyday life away from work.

We utilized reverse engineering on human thought and behavior (with additional data from the animal kingdom as a whole), and uncovered a four system information processing architecture in human beings. The key lesson learned is that each of these components is attempting to guide the individual to success in the game of natural selection, but they attempt to do so in vastly different ways.

Because these systems operationalize the primary drives differently, the behaviors they generate often conflict with one another, sometimes leaving the individual in a worse predicament than if the architecture were simpler. These system collisions and conflicts provide explanations for the failure of humans to succeed at will, and why even relatively enjoyable conditions still leave many individuals unsatisfied.

* Thanks to Dr Terry Teays of EvolvingSuccess® for the timeline on these systems.