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Welcome to our Analyst Report and Newsletter

Breaking through the cognitive barrage

We hear what we want to hear and we see what we want to see

- Biases drive cognition
  - Context drives biases
    - Remove the biases by removing the context (senseless context)
      - Learn the method (method/pattern) w/out the biases

A conversation with Charles

I have been working with Charles for something like 30 years, including the work we did on deception and counter-deception in the late 1990s and early 2000s. Here's a slight rewrite with some added explanation of a recent conversation we had… Format:

Commentary

Charles

> *Me*

Here we go… Charles is trying to better understand how we might understand the coding of information in peoples' brains to gain a true understanding of how we communicate to each other:

Ignorant to try to separate data from information, and sounds like I'm trying to redefine information in the face of information theory, but I think there is a lot of ignorance (other than mine) about the process of coding information in my brain into symbols that can be communicated and intended for your brain, and then what happens to those symbols.

> *It does not seem ignorant. The challenge is in getting clear definitions.*

> *Many folks have done these definitions before as well.*

> *I like the notion of separating the bits (binary) or other (up to analog multi-dimensional) differentiable / measurable values from their use (in context).*

> *And I do this all the time.*

> *In "Digital Forensic Evidence Examination", I talk about the bag of bits and their interpretation in context a lot - and about the physics of digital information.*

This is a book I wrote some years ago and updated for a while (Available for free on all.net under "Books"). In that book, in an attempt to clarify how to understand digital evidence for legal purposes, I started with throwing out many of the common assumptions, so that when looking at a "bag of bits" resulting from copying the traces of computer activities, we didn't assume they were encoded in any particular way or operating in a particular type of computer or operating environment.

Whether meme or not meme, if memes exist in the way originally described by Dawkins or by Aaron Lynch, who claims parallel development of the meme concept in "Thought Contagion".

> *Yep - which is why I defined computer viruses in the way I did (and do).*

> *A 'viral set' in context of a 'machine'.*

> *Perhaps I should have generalized (still can) to a set of machines... and discussed the set of changing in the context of different machines.*

The time frame for Dawkins' book – "The Selfish Meme" (1976) and my work on Computer Viruses (1983) reflect, I think, the underlying notion that ideas have time frames when they will emerge. In that time frame there were also other reproducing software and hardware mechanisms and theories, starting at least in the 1950s with von Neuman's 1949 work, and the breakthrough in global communications that preceded the Dawkins time frame likely also had impacts on many other thinkers of the era.

> In other words, I'm back advocating my "individual perception is individual and can't be bypassed" idea.

> *Not sure the "cannot be bypassed" is true. I suspect it can be.*

This exchange surrounds the issues of modern era brain scanning and control technologies. Modern mechanisms are increasingly able to learn from individuals enough to reproduce limited images reflecting of internal brain activity. They do this by presenting images to the eyes, watching emanations from the brain, and learning how to associate the images to the emanations. The current technology is still quite low fidelity, but nonetheless able to effectively read thoughts. The concept is nothing new of course, starting at least with the science fiction of "5 Million Years to Earth" (1967) and the early work on brain activity mapping reflected in the discussions in recent editions of "The Cyber Show" where Rand Waltzman describes his experiences with a leader in the field in the 1970-80. While brain structures are increasingly understood in terms of function and interaction, to the best of my knowledge at this time, it is unclear whether and to what extent actual images are more individual than structural in nature. Thus the "not sure" comment.

> As support for that, but without reference to transfer of ideas from your brain to mine:

> Ideas - new term in this context. Ahah! Suppose we stick with memes and identify them as the human cognitive version of reproducing sequences of symbols under evolution.

> > *Reproduction is the key to survival of these memes.*

> > *I also think in terms of generating sets.*

> > *That is, an "idea" might be considered as a generating set of a lot of specific memes, all members of the set, all of course in context.*

Here we are struggling with the issue of communication that is the core of the present discussion. In essence, how do we turn brain activities within one brain into wave forms transmitted and received by another brain, and interpreted to reflect the same thing in the second brain? Or do we in fact do any such thing at all?

"A stupid man's report of what a clever man says can never be accurate, because he unconsciously translates what he hears into something he can understand." - Bertrand Russell, "A History of Western Philosophy"

All people are, by this definition, stupid.

This is a 1945 reference, and as you can see, I get into my analytical mode in most such cases. This is very similar to the difference in definitions associated with evolution and the "survival of the fittest". It is often misinterpreted as a definition of survival in terms of fitness, which is essentially the opposite of the actual assertion issue. The definition of fitness is that which survives. Thus the definition of stupid by this criteria is all of us because we all unconsciously translate what we hear into something we can understand, and thus we can never be truly accurate in what we report.

I have done a little looking for experimental evidence that memes exist. Not that ideas can be transferred but that there is some identifiable property that makes them self-propagating. I have a lot more reading and online searching to do.

Like the notion of survival of the fittest from evolution, which most people have backwards, I think you have this backwards.

The property is reproduction, and the result is the notion of a meme.

This goes back to the mathematical theory of computer viruses, which are sequences of symbols in the context of a machine, which reproduce, even if imperfectly (i.e., also evolve) so as to make non-identical copies. The set of all the sequences that can be generated in the context of the machine are called a viral set. In that context, the property is also reproduction (production of a element of the viral set elsewhere from the execution by the machine of a member of the viral set), and the result of the property of reproduction is the notion of the virus. Of course this happens in the context of the machine, which in the case of the meme is the brain(s) of the organisms.

In the brain, as I understand it, the context of the machine includes a wide range of chemical concentrations, the connectivity and operational properties of the neurons, which are infinitesimal (analog continuous) and involve shape, size, location, etc. and which components communicate with signals that vary continuously in frequency over a finite range through the use of electrical waveforms, and the neurons form feedback loops that can change in makeup as dendrites change connectivity with time.

This not so subtle difference between digital machines and biological ones is laid out in the chapter on "The Physics of Digital Information" in the DFEE book identified above. Things get infinitely more complicated (at least aleph 2 for those who care) in the infinite granularity in space and time of the analog world, as opposed to the relatively simple world of the digital realm where there is finite time and space granularity.

In that context, signal sequences and chemical concentrations create positive feedback inducing what we might call internal states that change over time. The meme might be thought of in terms of higher level reproductive states - just as we scale up from bits to bytes to interpreted sequences in higher level languages in the digital realm, and some of those sequences reproduce (computer viruses). The communication of those memes is inherently imperfect

in humans, whereas in computers we have gotten them to the point where they are highly structured and reliable in communication, even if the interpretation varies from different states of the sending and receiving machines. As an example, the same sequence that works in one machine might crash another.

Part of the tradeoff between the digital and analog realms is that in the digital realm, things are inherently brittle because we lack the smoothness of a continuous (in space and time) system. A single bit difference will crash most digital systems (unless redundancy is intentionally introduced) whereas almost all minor differences in an analog system do not drive it into instabilities.

Since we each define our own language internally, these variations remain. However, we have learned to use tools (writing as an example) to fixate representations of memes in languages outside of the body in which we agree to terminology and usage to support efficient and effective communication. That is why definitions are so important - so we can get similar representations that can reliable reproduce within and between our brains. And that is why experimental reproduction is so important, because it allows us to fix the notions in written form to physical phenomena that can be tested by others, leading to common understanding (and in the case of science and engineering, the ability to predict and build things that work more or less the same over time and in a range of situations.

Returning to where we began

We hear what we want to hear… which is to say, we configure our cognitive mechanisms to interpret the analog experiences of our bodies. Those configurations are essentially biases in our physical mechanisms, that...

- **Biases drive cognition… s**o we bias ourselves at all levels of our cognitive system to create the context in which we understand things.

    ◦ **Context drives biases…** and of course those contexts we create then drive our biases which drives us into, possibly stable, cognitive viewpoints that resist alteration by ignoring at multiple levels of cognition, the realities of the world we actually exist in.

In order to defeat disinformation, there is a methodology being studied today

- **Remove the biases by removing the context (senseless context) …** The idea here is to create unexpected (senseless) information and get the recipient to interact with it. In doing so, their biases fail to prevent then from learning from it, and of course our brains are learning machines. But what will we learn?

    - **Learn the method (method/pattern) w/out the biases…** This approach uses the various knowledge gained over the years associated with cognitive errors. In essence, we want to create obvious nonsense that demonstrates the error so the observer sees the fallacy, but to do so in a context that bypasses their biases. The hope is that their brain will learn to match the patterns so as to detect the fallacy, and later on, they will adapt their biases as they understand the errors arriving as time moves on.