Social Media : "Surrogate Tribes"?

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Abstract. According to recent research, our complex neural-hormonal system (NHS) was shaped by evolution in function of its ability to protect our body's integrity, thus ultimately enhancing our genes' reproductive potential. Our "mind-body units" may hence be viewed as NHS-endowed "survival and reproduction machines" of our genes.

The *senses* in turn may be interpreted as prostheses of their carriers' respective NHS, as they are capable of converting electro-magnetic waves, air vibrations, or other environmental signals, into luminous, acoustic, or other sensations to which we arbitrarily assign specific *qualities* that they in themselves do not possess.

Communicating instruments developed in the recent past (radio, TV, telephones, internet etc.) are becoming like "second degree" prostheses of our previously evolved NHS prostheses, i.e. the senses.

One of our main NHS' emergent properties is to distinguish between positive and negative hedonistic tones (pleasure and pain), which generate emotions and instincts; the latter consisting of gene combinations that were selected as they codified neural-hormonal patterns of response to environmental challenges inducing behaviours best granting, in the average, the reproductive success of their phenotypic carriers [8].

According to recent neuroscientific views [4], the whole neural-hormonal network has evolved as an extremely fine-tuned re-elaboration of our primordial ancestors' cell membrane, basically serving the same purpose of protecting the integrity of its underlying genes' "phenotypic envelop", i.e., the body. In fact, our mind has evolved as a complex machinery constantly monitoring our inner state. The "emotional colouring", which is generated by the NHS, and characterizes all activities performed by our mind, thus appears to be indispensable for the preservation of the vital processes generating that "well-being" state.

Any "species", including ours, can be viewed as a "DNA consortium", an involuntary and unconscious way of survival and reproduction that allowed the propagation, so far, of their respective genetic pools. We, "individuals", aren't, in this perspective, but physically separated variants of the shared broader DNA consortium, i.e. of our common genetic pool.

Within this context, individuals were selectively advantaged who best fit the needs of their troop/tribe's social structure (in its turn emerged from a previous, in fact a parallel, selection), as they were carrying the tribal instincts that best granted their community's genetic pool's survival and reproduction [14]. Thus, individual selection compounds in the long run with social selection.

In this context, social media, and networks, may be viewed as a sort of "surrogate tribes", i.e., updated instruments of a contemporary version of the evolved human social communities.

1 Introduction

According to evolutionary biology, our very complex individual phenotypes are the end-results of an equally sophisticated gene-network, i.e., of genes unconsciously interacting with each other in such a way that their end-product made them survive in preference to the end-product of other networks/patterns, the latter being outnumbered because of the former's higher reproduction rate in their given natural and social environment.

In this context, both our body and our mind seem to be the result of biological evolution by natural selection [3], [5]. More specifically, both physical and psychological traits of our phenotypes appear to represent the end-results of a complex chain of processes triggered by our genotypes' proteinopoietic activity.

In fact, our body which, as a sort of "envelop", harbours and protects our genes, and our mind, whose neural correlate is our complex neural-hormonal system (NHS), appear to have evolved (by selective differential reproduction rate of their phenotypic carriers) in function of protecting our body's integrity, thus ultimately enhancing our genes' reproductive potential [4].

In this perspective, mind-body units may be interpreted as "survival and reproduction machines" of their underlying genes [6].

2 Emergent Properties of our Neural-Hormonal System

2.1 The senses

Representing the biological interfaces with the outer world, the *senses* appear to have evolved as prostheses of our neural systems. Senses, in fact, may be defined as *transductors*, capable of converting electro-magnetic waves potentially perceivable as *luminous*, or air particles' vibrations potentially perceivable as *acoustic*, into sensations to which we arbitrarily and conventionally assign, within each species or broader biological category, particular *qualities* that they in themselves do not actually possess [8].

Within the whole spectrum of electro-magnetic waves and air vibrations, the range "captured" by the evolved brains and senses of each species has been tailored by natural selection to the one that, in the past generations, turned out to effect the highest average reproduction rate of their phenotypes in that given environment, and hence the widest spread of their underlying genotypes. Even size-wise, humans and their closest related species have evolved brains and senses that do not perceive macro- or microcosmic, but only "meso-cosmic" entities, i.e. entities

which our ancestors necessarily came across, and had to deal with, in the course of their lives [2].

2.2 Hedonistic tones

One of the main emergent properties of our NHS is its fundamental capacity to distinguish between positive and negative *hedonistic tones* (pleasure, pain, and every sensation in between the two ends of the perceivable emotional spectrum) [8].

The latter capacity rests upon an elaborate network connecting certain inner brain areas, mainly located in the "limbic system", with specialized groups of nervous cells secreting neurotransmitters, such as dopamine, serotonin, etc., and neuro-hormones, such as endorphins, oxytocin, etc. All these molecules, when released upon recognition of an appropriate triggering signal by the cells where they are normally stored, travel to, and impact on, their specific receptors situated on their corresponding target cells.

2.3 Reflexes and instincts

Natural selection rewarded those phenotypes endowed with a NHS that associated a positive or a negative hedonistic tone, respectively, with situations and events enhancing or inhibiting their survival and reproduction, thus originating reflexes and instincts. The latter may be defined as genetically transmissible associations of neural-hormonal rewarding/penalizing mechanisms with their resulting specific survival- and reproduction-enhancing skills/potentials. Instincts, in other words, may be viewed as a kind of "unconscious bridles" that guide us in our thoughts and in our actions.

2.4 Emotions and feelings

In addition to reflexes and instincts, the hedonistic tone system also originates emotions and feelings.

Emotions may be defined as *amplifying modulations* [8] of the basic, positive or negative, DNA-imprinted hedonistic tones, allowing their carrier organisms to specifically adapt their behavioural responses to the great variety of natural and social environmental challenges they are exposed to. Feeling, in man, represents a further fine-tuning capacity resting upon the development of autobiographic self-consciousness [4].

Why modulations? *Qualitatively*, organisms developed the capacity to select, within a generally positive or negative hedonistic background, a number of different neural-hormonal patterns appropriately fitting different situations to cope with (e.g., fear, jealousy or rage predisposing to different behaviours within a generally negative hedonistic tone).

And why amplifying? *Quantitatively*, organisms developed the capacity to tailor the intensity of their emotions to the biological impact of the triggering events. Amplification of the emotional colouring roughly reflects the increase, or decrease, in biological fitness of the carrier's organism in relation to the initial situation.

The broader the range of possible modulations and the ampler the intensity of the positive or negative emotion evoked, the higher the likelihood of the underlying gene combinations to survive, reproduce, and spread within the subsequent generations.

2.5 Genetically predisposed fine-tuning of emotional responses

While reflexes and instincts are phylogenetically selected and consolidated by adaptation to a relatively constant environment, emotions and feelings are ontogenetically learned and potentially adaptable to individual experience. Neural-hormonal mechanisms, such as the "mirror neurons" system [14], grant the necessary flexibility to adapt the organism's emotional response to a virtually infinite variety of triggering events and situations it may be exposed to during the course of its life. Thus, organisms gradually acquired the ability to qualitatively and quantitatively fine-tune the appropriate responses tailoring them to the specific situations encountered, choosing from a more basic repertoire of reflexes/instincts directly tied to survival and reproduction, and made available by ancestral, previously consolidated structures and functions [4].

In this respect, memory plays an analogous role: qualitative and quantitative fine-tuning of the response is related to a learning process whereby previous individual experiences exhibit a booster effect, biasing the organism's selection and modulation of the most appropriate emotional response, based on the previously retained/stored experience.

Thus, natural selection rewarded, and spread through the next generations, those genetic blends that codified neural-hormonal patterns of response to environmental challenges which induced behaviours best granting, in the average, the reproductive success of their phenotypic carriers [9].

2.6 The "self" as a biological construct

All these genetically predisposed phenomena, generated by our NHS in response to the outer and inner signals it comes across, ultimately serve the same purpose as our primordial ancestor's cell membrane, of which it seems to represent the ultimate, extremely sophisticated re-elaboration: protecting the integrity of the body, i.e., of its underlying genes' "phenotypic envelop" [4].

Remarkably, the human "self" is not originated by the outer world, but by the inner body, as our mind has evolved as a complex machinery constantly monitoring our inner state. In fact, it is this very inner state (the "milieu intérieur" according to Claude Bernard) [1] that hierarchically overrides our NHS, due to its vital importance in protecting our genes' survival, and their reproductive potential. All visual, acoustic, and other images impacting on us, are thus elaborated, and attributed a qualitative value (emotional colouring) which is closely connected with the preservation of the vital processes that generate that state. The body integrity is the prerequisite for all this. In short, it's the mind serving the body, and not the other way around [4].

The sense of individual identity seems to have been rewarded – and consolidated – by natural selection, as an extremely sophisticated development of the outer envelope protecting the body's integrity, and its continuity throughout time. In this connection, the "autobiographic, extended consciousness" appears to be the end result of a long evolutionary trail that, starting with the "proto-self", has led, stepwise, to the "core self" and, finally, to the stage of the "autobiographic self" [4].

In this connection, it is important to note that, according to Thomas Metzinger [10], no such things as selves exist in the world, and the phenomenal "self"-model, i.e., the very sensation of being an "I", is not a thing, but an integrated process and, ultimately, an illusory construction of our "biosystem", a sort of metaphorical representation of our body's integrity and continuity throughout time.

2.7 Evolutionary psychology

As the NHS is not a static phenomenon, but a dynamic process based on a continuous turnover, it changes with time. In fact, our gene-networks' activity unfolds in a complex feedback-regulated time sequence.

According to evolutionary psychologists [3], neuro-embryological development and, subsequently, neural-hormonal phases of development characterizing the course of our life after birth, seem to be genetically imprinted and pre-programmed as a result of cumulative natural selection mechanisms advantaging individuals whose resulting sequential behavioural patterns exhibited a fine-tuned adaptation to their natural and social environmental set-up.

3 Human Communities and Social Media

3.1 The species as a comprehensive "phenotypic envelop" of its genetic pool

Any "species", including ours, can be viewed as a "DNA consortium", an involuntary and unconscious way of survival and reproduction of its shared genetic pool, that allowed its propagation so far in the environmental niches it was exposed to all along the course of its evolutionary history. Thus individual selection, in the long run, appears compounded with what Gould calls "species sorting", i.e., species selection [7]. In this perspective, we, the "individuals", aren't but physically separated variants of our broader DNA consortium, i.e., of our shared genetic pool.

3.2 The evolution of human communities

Within this context, but at a subordinate level, those individuals were selectively advantaged, who best fit the needs of the troop/tribe's social structures, which in the meantime had emerged from a previous, in fact from a parallel, selection. According to sociobiologist Edward O. Wilson [15], troop- and tribal identities, i.e., the sense of belonging to their community, as well as troop- and tribal hierarchies, were then selected among our ancestors as survival- and reproduction enhancing instinctual adaptations, to the extent they were protecting the integrity of the collective "envelop". The selected individuals were the ones carrying the tribal instincts that best granted the success of their respective community's acquisition, and defence from other tribes and predators, of the food and space necessary for their genetic pool's survival and reproduction.

Genes were selected that predisposed their phenotypic envelops to the sharing of tribal behaviours, beliefs, practices and emotional involvements, including collective excitements such as playing, dancing, singing, etc. These instinctual behaviours all contributed to inclusion of their individual organisms into their surrounding, mainly next of kin, community [13]. Adherence to the shared "biased thinking" (tribal prejudices, taboos, commonly accepted stereotypes, etc.) turned out to be advantageous for their carriers, hence psychologically rewarding (Facebook's "I like it" may sound like a pale vestige of one of our ancestral reward-system arousal factors). Isolation, self-exclusion, and marginalization instead, all resulted in selective disadvantages, leaving less chances to survive and reproduce to the carriers of those alternative exclusion-inducing instinctive traits, and hence of their underlying genes.

3.3 Language

We have the potential to use to their full extent the instruments made available to us by our NHS-endowed "survival and reproduction machines". Among all these instruments, language plays a paramount role to communicate, both rationally and emotionally, within human societies. In fact, since perceptions are automatically and rapidly translated into language, we have evolved as verbal creatures [12].

3.4 Tribal instincts showing through the social media

In addition to language and other previously evolved means of communication between humans, all communicating tools developed in the recent past, such as telephones, radios, televisions, computers, e-mails, the internet, and the whole cornucopia of their network "derivatives", are swiftly becoming a sort of "second degree" prostheses of our anciently acquired NHS-prostheses, i.e., the senses. Humans have developed the technical tools that offer them the possibility to exchange verbal and visual messages at any distance. Conversations, debates, gossips, photographs, videos, voice recordings, etc., all possibly contribute to the strengthening of the ties between members of the same "tribal" community.

3.6 The role played by sexual selection

In the sort of "ping-pong" game called sexual selection, gene combinations were selected that – via NHS - "suggested" attraction to certain physical or psychological

traits of their potential partners' phenotypes. Peacocks, for instance, that instinctively exhibited their magnificent tails (a powerful proxy standing for "good genes"), were involved in the reproductive success of peahens that in turn had been selected to the extent they were impressed and attracted by those very tails, which ultimately had granted a higher reproduction rate to their peacock carriers in the first place.

Through the media, in general, and the social media in particular, a possibility is offered to the "human peacocks, and peahens" to exhibit, as a kind of "ornament", their very "intelligence" [11], or other mental or physical attributes, to their potential partners in the web. The social media thus convert, also from this point of view, into convenient instruments to convey all kinds of messages (not only "friendship"!) to the other members of the modern tribal community.

4 Conclusion

In conclusion, social media may be seen as updated instruments of a contemporary version of the human social groups, a sort of "surrogate tribes", instinctively dictated, in ultimate analysis, by our genes.

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