

**Biologically based behavioral research
and the facts of law**

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Can we find precursors of human cultural characteristics among primates? Eugen Ehrlich in 1913 postulated two primary functions of the living law: organization and protection of the social order. His theories are compared with observations of ethologists in order to explore possible new insights into legal behavior. To what extent do the implicit rules of

non-human primate social orders reflect the four behavior patterns that Ehrlich called "the facts of law" -usage, domination, possession, and "disposition"? To what extent is such legal behavior affected by endorphines and by other biological mechanisms?

THE LIVING LAW

If we accept the Darwinian theories that the human species descended from an ancestor shared by apes and other primates, it follows that we may find precursors of human characteristics in the animal kingdom, (Edey, 1972: 132 -133). Can ethological observations provide data that point to precursors of legal human behavior in non-human primates? The theories of Eugen Ehrlich, one of the founding fathers of the sociology of law, are compared with observations of ethologists in order to explore possible new insights into legal behavior and the various factors that contribute to the effectiveness of law.

Ehrlich (1913) formulated his "Fundamental Principles of the Sociology of Law" approximately 80 years ago, before World War I. One of his major contributions was to introduce the concept of the "living law" to describe the observed interaction of people within a legal system -the law in action as opposed to the law on the books. (Rehbinder, 1977: 10 -11; Podgorecki, 1981: 183).

Ehrlich's ideas are based on his observations of the law in action, observations of what we today would call human social interactions. Observation is the scientific tool with which ethologists build their theories of animal behavior. Scientists discern patterns in the social interactions of individuals, whether analyzing the observed behavior of human beings or other animals. Ehrlich used the term *Rechtstatsachen* or "facts of law" for those patterns of human behavior which seemed to be basic facts of everyday social and legal transactions. He stipulated four facts of law: usage, domination, possession, and disposition.

Ehrlich defines law as the inner order of a society. Law has several functions, above all the function of *organization*. The law presents the individual with alternative choices and points to those choices that the individual's society finds acceptable or "just." The individual can then choose to act or refrain from acting. By knowing the moral consensus of the majority, which, in this case, is the same thing as the "society's concept of justice, the individual can predict with some degree of accuracy the consequences of his choices.

Ehrlich sees a second function of the law: *the protection of the social order*. This function is supported by the "decision-norm," which

complements or fills in gaps in the legal structure and thus makes law more effective. The decision -norm within a society is usually expressed through adjudication, which enables the law to be flexible and to adapt the rigid rules of legislation to individual cases.

Can we discern functions of organization and protection, a kind of "inner order," at work in non-human societies? Through the millennia, more evolved species have achieved greater and greater flexibility in their social organization, making them more adaptive to drastic changes in their environment. It seems certain that this trend is due to the evolutionary growth of the cortex and the increasing differentiation of the cortical functions. However, the phylogenetically older part of the brain, which developed millions of years ago and served in conditions drastically different from our current environment, still exist and function simultaneously with our more recently evolved brain structures (MacLean, 1970, 1978a; Hamburg, 1975). Adaptive mutation means that from time to time something new is added to an existing structure (e.g. human brain) that can correct or complement those parts of the older structure that have outlived their usefulness and might drive us in a maladaptive direction.

Perhaps a similar process takes place within the law. The human concept of "law and justice" reflects the rules, mores and limitations of the social framework within which each individual grows to social immaturity. Rarely are laws repealed outright when they no longer reflect the consensus of the group. They usually lead an existence in the books for many years, even they are not enforced and for all practical purposes are non-existent in the real world. These outmoded concepts can be continued or resurrected by people who are strongly bound to a particular tradition or religion. These traditionalists may react more strongly to the rules of their sub-society and adhere more rigorously to its laws than does the average law-abiding citizen of the Western World. Usually, these rigorously obeyed laws are supported by religious commandments. From an evolutionary point of view, religions are based on emotions that are nourished by reactions and impulses derived from phylogenetically older parts of the brain.

Ethics, beliefs, morality, the qualities that make us human, and all the values we cherish, are strongly influenced by the regions that already existed in the reptile brain millions of years ago. They are mediated by the old limbic-hypothalamic-midbrain circuits probably built into the machine because they worked well in its adaptation over many thousands of years." (Hamburg, 1975:46)
Although human beings are the only species, capable of conceptual

izing the rules by which they live, non-human societies also live by implicit rules. In all societies, a rule by definition is obeyed by the majority and is sometimes broken by some individuals. The more rigid the code, the greater the adverse consequences for those who disobey. In the rigid genetically-coded social organization of the bees, breaking the code of behavior that dictates that a bee must return only to the hive from which she originated is almost always fatal (Frisc h, 1950, 1955).

Many human societies have codes and punishments regulating the purveyance of wrong information, or lying. Distrust of strangers and punishments for deception are frequently found in simple societies, where misdirected food-gathering expeditions or misinformation by strangers about fruit-ripening can have damaging consequences (Kummer, 1980:5).

The more evolved a social species becomes, the more flexible the rules of social behavior-and the more difficult it becomes to draw the line between behavior that is within the norm (compliance) and behavior that is outside the norm (deviance). Of course, in the biological sense, there is no connotation of good or evil in the concept of deviance. However, deviance and evil have always been interrelated in human societies.

Biologists postulate that evolutionary changes (including the continuous development of the human brain that enabled *Homo sapiens* to emerge as a species) had to start with changes within individuals who did not stay within the norm but changed through mutation. Why then is it necessary for human social organization to harbor concepts of goodness and evil, justice and fairness, or other value judgments in coping with those who do not stay within the norms? How does this relate to the facts of life and the "facts of law," which are the reality of human interactions?

Is the "sense of justice" (Gruter, 1976, 1980) the individual yardstick for right and wrong, one of the tools available within the human brain to organize social groups (the first function of the law) ~ and to protect the group (the second function)? Ehrlich, like many others, also asked this question. He stated that the scholars of his day could only provide unsatisfactory explanations, and expressed the hope that "the jurist and the legislator will gradually become more and more like the modern scientifically-trained physician in proportion as society is able to trace and present the laws of the development of human society." (Ehrlich, 1913 [1975:243-244]) New insights into the evolutionary process show that modern *Homo*

sapiens could only evolve to the present level because a conceptual framework of rules evolved with the increasing differentiation of the cortical functions in the human brain. During this long simultaneous evolution from genetically -controlled social organization, the rules and norms of behavior took on their own existence as abstract rules in the minds of individuals through their interaction within and among social subgroups. The "legal system" is a totality of which written codes form only a part. Humans express or live legal rules by choosing \whether to obey or disobey {Friedman, 1975: 67}. They are often \motivated by emotions while making their choices.

Emotions can be controlled by certain regions of the cortical part of our brain only to some extent. Often they originate from, and are supported by, complex mechanisms in our limbic system. Some of these emotions motivate our responses to rules, which is our legal behavior. If legal behavior is crucial for our survival as a social species, it follows that any mechanism that can help in motivating adequate responses to rules is adaptive. Emotions which are caused by concepts of good and evil, right and wrong, have been helpful in directing and controlling legal behavior. The ability to make value judgments and the yardstick by which humans arrive at such value judgments of right or wrong -their "sense of justice" -have proved adaptive.

An essential part of this mechanism is the "internal reward system" {Routtenberg, 1978; Danielli, 1980) with its ability to release mood -controlling substances in the brain, such as opioid peptides, also called endorphines. In describing the evolution of the reward system, Danielli refers to the statement by Marx that "religion is the opium of the people" and suggests that we might be more accurate in stating, "ideology is the opium of the people." People who believe in religious or ideological causes may well be rewarded by a feeling of well-being due to the release of opiates in their brain. Let us assume for our purposes that the internal reward system is part of the mechanism that we call the "sense of justice."

THE FACTS OF LAW

Parallels in the structure and function of social organization in different species have been postulated. Now the four behavior patterns that Ehrlich called the "facts of law" will be compared with possible precursors in non-human primate societies. Behavior patterns become evident during observations of social interaction.

Usage

The oldest fact of law, according to Ehrlich's observations, is *usage*. "Usus" or "mores" keeps the inner order within societies. Usage is a part of structured social interaction and can be investigated empirically.

Order can be maintained in human societies by various means among them constitutional law, legal norms or adjudication. Ehrlich observed that *usage is decisive* in individual cases within a given structure, especially in cases where there are differences of opinion in the interpretation of law or when new developments have not yet been regulated by formal law.

Usage is the rules obeyed by a majority within a society. It can be abstracted into formal law but is valid even without official sanctions. What is currently innovative or even deviant, behavior may become the future norm for the majority as environmental, biological and technological changes or other developments put pressure on legal structures and test the present or future adaptiveness of existing norms.

Examples from non-human societies demonstrate the emergence of new behavioral techniques, which are slowly adopted by the majority (Marler *et al.*, 1972: 42-43) and become "normal" behavior. Environmental pressures can force adaptations in sleeping habits, and even changes in the social structure of non-human primates (Kummer, 1971b: 131-135).

In Ehrlich's opinion, usage is determined by economic pressures and the results of individual competitions for dominance or power within societies. These power struggles are an integral part of economic changes. For example, the invention of the railroad, and of motor-driven vehicles in general, required a tremendous number of new laws and legal instruments to solve the problems brought about by these developments, often granting new powers to individuals and institutions. In the United States, the rights of married women had to be extended to permit them to own real property when predominantly male emigration to the West made many women "grass" widows. Many commercial practices have existed as "usage" long before legislation gave official sanction to the rules that were used to facilitate the exchange of goods and services (Friedman, 1973: 318-322).

Ethological observations document changes in group behavior brought about by changes in the environment or by the struggle for dominance within non-human social structures. Goodall's observations of the behavior of a group of chimpanzees over a period of 20 years illustrate how the struggle for dominance can influence the social behavior of a chimpanzee community.

During the observation period, there were no drastic natural changes in the environment affecting the supply and variety of fruits and other desirable goods. However, observable changes in chimpanzee behavior became apparent early in the field work when large quantities of bananas were made available to them by field workers.

Normally chimpanzees have to spend an average of six to eight hours every day traveling to the food supply, and gathering and eating sufficient amounts. Providing the chimpanzees with a much-liked food in insufficient quantities for all the individuals in the group, greatly increased aggression among the chimpanzees, and between the chimpanzees and baboons that occupy the same territory. Did this "economic change" affect their ability to control their aggressive drives, the balancing act that in humans is called "fairness" and is guided by the "sense of justice"?

Changes in the social organization of the chimpanzees can also be caused by the personalities of the different chimpanzees, especially the alpha animal, and their ability to make use of certain changes in the environment. Mike, a relatively low ranking and medium-sized adult, made use of empty gasoline cans discarded by the field workers to become alpha animal by incorporating the gasoline cans into his display. The resulting noise and commotion he created terrified the other chimpanzees and allowed him to reach the alpha position within a few months and maintain the position for almost six years.

To a certain degree, the personality of the alpha animal may influence the behavioral norms of the group; the absence or presence of the alpha animal certainly does. The amount of protection for weaker individuals depends on the availability of high ranking males. During 1975-78, Goodall observed that two female chimpanzees were killing infants and eating them. It was observed that the mother of a threatened infant turned to the males for protection against the potential killers. These males threatened the wrong-doers and chased them away (Gruter, 1979:44).

Goodall and others have also observed that the behavior of a mother will influence her offspring's behavior in many ways. Offspring of high-ranking mothers usually attain a high rank for themselves when they grow up, an obvious parallel to human society. The choice of food, the preference for certain fruits, meats or termites is also learned from the mother (Goodall, personal communication).

All the behavior patterns that make up the norms of a society and give structure to the group can also be seen as part of the struggle for dominance, which exists in all primates societies, both human and

non-human. The concept of dominance is related to Ehrlich's second factor of law.

Domination as a "factor of Law"

According to Ehrlich, domination results from the fact that weaker members of a group need protection. Ehrlich postulates that whenever the "dominated" or weaker individual is unable to protect himself, his protection is taken over by a higher ranking individual. In human societies, legal and political definition of human rights are one method of protecting less powerful individuals.

Lorenz was one of the first to observe that in the so-called pecking order of several bird species (chickens, ducks, crows, etc.) high-ranking animals may interfere in fights of lower-ranking birds to protect the weaker of the two fighting individuals. It has also been recorded for baboons (Wickler, 1971: 138). Goodall's observations show that a male chimpanzee will come to the defense of mothers whose infants are endangered, as in the case of Figan, who threatened; Passion and Pom (the two marauding female chimpanzees) when they attacked.

Another mechanism in animal societies that serves to protect weaker or "dominated" individuals is the formation of subgroups such as hierarchical orders for males and females.

All non-human primates nurse their infants and carry them with them for several months, and even for several years. The infant is completely dependent on, or "dominated" by, the mother. This relationship is nourished and strengthened by many biological, physiological and psychological mechanisms. The close bond evokes a feeling of well-being in both mother and infant.

Hormonal processes during pregnancy, childbirth and the nursing stages strongly influence maternal behavior. Reciprocity and feedback are an important part of the first social interactions ensuring survival for the infant and providing satisfaction to the mother.

Even in non-human primates, this behavior is not dictated absolutely by biological mechanisms or genetics. Studies of chimpanzees and other primates have observed that females are capable of learning maternal behavior to some degree. Female juveniles learn from observing their mothers caring for younger siblings. There is a likelihood that the female child of a successful mother will also become a successful parent. Chimpanzee mothers are capable of becoming "better," more efficient and caring mothers with their second child.

It is possible that a sense of well-being is similar to that originally

generated by hormonal changes during the childbearing period can be experienced again when the mother shares food with offspring, or even with other group members. This tendency towards altruistic behavior based on interactions that generate reciprocity and mutual feelings of well-being can perhaps expand and develop in other interpersonal relationships, even if these feelings are no longer triggered by "hormonal processes but by other stimuli to the internal reward system.

Ehrlich postulates that domination is a fact of law in all human societies, and that it provides mechanisms that protect weaker members of the group. Does this imply some altruistic motivations in the stronger individual? If altruism is a factor in dominance, is there a biological basis for altruistic tendencies that exist in different social species (Dawkins, 1976)?

There is a readiness to act altruistically could only develop as the result of many different stimuli. An important discovery is that a reward system does exist as a cerebral mechanism that produces a sense of well-being, and can be triggered by various actions and stimuli. These various stimuli cause the production of substances in certain centers of the brain, similar to but more potent than morphine, which cause a feeling of well-being in the individual (Routtenberg, 1978; Danieli, 1980; B. Hoebel, this volume).

People have long been accustomed to the fact that emotions are states of feeling that can be affected or triggered by the intake of drugs such as opium, marijuana, cocaine, LSD and alcohol. Recent experiments with the salts of lithium demonstrate the potential for chemical substances to alter feelings and behavior. One researcher posits that "the physiochemical simplicity of lithium arouses the hope that it will provide a light to clarify the neuronal basis of moods" (Tosteson, 1981:4). This type of research may help to discover when and why obeying the law makes humans feel good, even when obedience involves self-sacrifice or so-called "altruistic" behavior.

As new research in neuropharmacology elucidates the sites and causes of these chemical processes in the brain, methods are being explored to locate and measure the chemical compounds and to localize the receptors and analyze their functions. What research can discover about motivations towards legal behavior due to endorphin production is especially relevant to legal scholars. Research may also show ways to measure environmental influences on these processes.

Domination as a "fact of life" seems to be related to the evolutionary growth of the human brain and the chemical substance produced in the brain that gives individuals a feeling of well-being. Human society

could only have evolved because the human species has been capable of forming systems of ordered interpersonal relationships, or social orders, which are not genetically transmitted in a rigid code but are flexible and adaptive to the demands of changing environments. One of the facts that makes social order possible is the feeling of well-being produced in individuals who feel part of their social order, are comfortable with their status within the hierarchy, and derive protection, companionship and security from it. Ostracism is one of these severest punishments in many social groups, because of the devastating effect on the individual deprived of his "place" in the social order.

The ability to accept and tolerate "domination" is also necessitated by the lengthy period of social immaturity for the young in human and non-human primates. Without some form of domination that produces well-being, the young in these societies could not survive. This leads us to the third "fact of law," possession, insofar as the mother-child domination may well have resulted in the concept that if one person "dominates" exclusively, he or she thereby "possesses."

Possession

Possession, Ehrlich's third "fact of law," can be seen from an ethological point of view as the result of the more differentiated social organization that evolved simultaneously with the brain. The concept of possession may have partly developed from the mother-child relationship. Human and non-human primate societies alike give the nursing mother the "right" to actually hold and possess her infant, as long as she performs her maternal duties. In non-human primates and other animals, the mother-child relationship is usually respected (but see Fossey, 1981). Respect for possession has also been observed in pair-bonding situations among the hamadryas baboons (Kummer, 1980:100; Gruter, 1977).

However, bonding is only one of the possible mechanisms that can evoke respect for possession in others. Generally, it seems that this feeling or attitude results when others perceive the physical closeness of individuals (such as mother and child) or of an individual and an object (a person using a tool or a hunter holding his prey) as one unity or gestalt (Gruter, 1977, 1979) in which the dominant one possesses the other. Lewellyn (1977) concludes from this physiological phenomenon that people in the abstract sense also accept the unity of certain concepts like "sale," "lease" and "corporation" as one concept, but do not pay attention to the attributes or legal conditions that make up: "., are part of the legal definition of "sale." He concludes that people

not recognize norms by perceiving details, but by perceiving the entire picture.

Perception of a familiar gestalt evokes impressions of rightness in the viewer, producing feelings of well-being. Unfamiliar or "wrong" impression triggers feelings of fear (a possible explanation for the prevalence of xenophobia in many social groups) that can turn into aggression accompanied by a change in hormonal production. Until a balance of positive feelings of "rightness," rather than negative feelings, can be reached, the imbalance and impressions of "wrongness" may cause feelings of depression, despair, and destruction (Gruter, 1977:217).

The concept of possession may have evolved from the "right" (in the eyes of the observer) of an individual to possess exclusively what he carries with him, supported by the production of endorphines. The visual stimuli of perceiving individual together, or an individual and an object (container, tool, weapon or prey) as a gestalt, may trigger endorphine production. Even chimpanzees defend what they can carry with them, perhaps expecting that it is their "right" to possess, whatever they can physically carry.

During a period of field observation of the chimpanzees in Gombe, field workers fed the chimpanzees considerable quantities of bananas. Some animals consistently tried to hold on to more and more bananas, which repeatedly slipped from their grasp. Although the animals appeared to be frustrated and almost bewildered by the situation, they persisted in their attempt to carry off or "possess" more than they could hold. The fact of "possession" also led to aggression. Goodall reports that the only time in 20 years of observation that she was seriously attacked by a chimpanzee was when she attempted to take a banana dropped by a female who held dozens in order to give one to a young chimpanzee who possessed none. The greedy chimpanzee can be said to have regarded the bananas she was carrying as her possession or "property" (Goodall, personal communication).

The respect engendered by the possessor's determination to defend his property may account for situations in chimpanzee societies where higher-ranking animals beg food from lower-ranking animals during meat-sharing after the prey has been caught.

Respect for the possessor and his possession may have developed as a behavioral trait in a biological sense, as well as a culturally supported behavior, over a period of hundreds of thousands of years. A framework of conceptualized behavior patterns has evolved that includes domination over objects, and criteria for possessions similar to Ehrlich's "facts of law."

This development can be seen as part of human phylogeny, as well as a part of human development in early childhood and through life (ontogeny).

Disposition

Disposition, Ehrlich's fourth and final "fact of law," involves contracts. In the legal sense, contract requires two dispositions - offer and acceptance - and a third essential, agreement. Once contract is accepted as a fact of law, the concepts of breach of promise, breach of contract, guilt, responsibility, liability, damages and punishment, follow. Some form of contract has probably existed in all human societies (Malinowski, 1926).

Ehrlich claimed that all norms, whether legal or extralegal rules, serve an organizational function in society. All norms are prescriptive or proscriptive, according to Ehrlich, demanding certain actions or non-actions. All norms that demand actions within a society must be both heteronomous and autonomous-out-directed - because they derive their effectiveness from the group's concept of justice, and inner-directed because each individual must recognize and obey these norms ("sense of justice") for the society to function. Recognition of and obedience to the rules by the majority of the members of a group, constitute a valid norm. These norms then represent the structure of the society, or group organization.

"Group organization" evolves into a system founded on the interactions between individuals (domination), between individuals and objects (possession) and their reciprocal actions (dispositions or contracts).

NEW INSIGHTS - NEW QUESTIONS

How do Ehrlich's theses compare with Darwinian and Mendelian theories and findings, and with the accepted laws of nature by which the human species evolved? One problem posed by Darwin's theory has been to make it compatible with the tendency towards altruism that exists at least partially in all human societies. According to Darwinian theory, "altruistic genes" would die out naturally since their existence would lessen an individual's fitness to reproduce. Those individuals who sacrifice themselves or their reproductive success in favor of altruistic actions endanger the propagation of their qualities, more than individuals who do not act altruistically.

Darwinian theory, however, refers strictly to individuals rather than families, groups, races or species. Darwin did not use the term

"survival of the fittest" in the sense that a certain class or race within a species will survive, or one species compared to another species. His statement was merely that the individual who is capable of having more reproductive success than others in the same environment, and who is capable of raising his offspring to sexual maturity, will transmit more of his genes to posterity. Hamilton, Trivers and others linked Mendelian theories and Darwin's to demonstrate that altruistic behavior that helps close relatives to have reproductive success can indeed transmit more genetic material of the altruistic individual to following generations (inclusive fitness) (Trivers, 1971; Hamilton, 1964; Axelrod & Hamilton, 1981). The "altruistic" individual, of course, does not have to be aware of this.

Human tendencies towards reciprocity, postponement of gratification for future good, and the ability to act on cost-benefit calculations, play an important role in the development of modern social organizations. Precursors of these attitudes can also be observed in the behavior of some non-human species.

Chimpanzees are capable of thinking and can project to the degree that they will forego instant gratification for a better return in the future. Chimpanzees carefully select only ripe fruit, leaving unripe fruit for the future after careful touching and testing. Chimpanzees have also made rudimentary tools to fish termites out of a heap without destroying the entire heap, choosing a lengthy and laborious method of fishing for small insects rather than destroy their entire termite supply.

There are examples in other species where individual animals use foresight and planning to achieve a goal (Gruter, 1979). Certain rituals of courtship and mating in many species depend on reciprocal actions, as do maturity rites and other rituals. These are behaviors that require timing, some form of planning, or postponement of gratification.

Reciprocity in the interaction of non-human species can be seen as the precursor of contract in human society. Perhaps the link between all these different aspects of reciprocal behavior is that the individual gains a sense of well-being when he acts in accordance with partly innate and partly learned rules. Due to the production of endorphins in the brain of the law-abiding citizen, can an individual become dependent on, or at least accept, the rules of his society? If obedience to the law and the acceptance of one's place in society can trigger the production of endorphines, "the opium of the people" may have a beneficial effect after all by preserving the continuity of social structure. This does not mean the perpetuation of the status quo at all.

time since many different religions or ideologies with different goals can trigger the same mechanism. This interpretation also does not imply that the individual must blindly follow innate commands. Obviously, the individual still has a wide choice; he can refrain from behaviors that cause both pleasure and pain, and can choose different stimuli to gain the same or similar, effect. Whether this is a wide or a limited choice, "free will" or a narrow spectrum of alternatives may well be in the eye of the beholder.