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# EVOLUTIONARY ROOTS OF PROPERTY RIGHTS; THE NATURAL AND CULTURAL NATURE OF HUMAN COOPERATION

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## 1. INTRODUCTION

Debates about the role of natural and cultural selection in the development of prosocial, anti-social and socially neutral mechanisms and behavior raise questions that touch property rights, cooperation, and conflict. For example, some researchers suggest that cooperation and prosociality evolved by natural selection (Hamilton 1964, Trivers 1971, Axelrod and Hamilton 1981, De Waal 2013, 2014), while others claim that natural selection is insufficient for the evolution of cooperation, which required in addition cultural selection (Sterelny 2013, Bowles and Gintis 2003, Seabright 2013, Norenzayan 2013). Some scholars focus on the complexity and hierarchical nature of the evolution of cooperation as involving different tools associated with lower and the higher levels of competition (Nowak 2006, Okasha 2006); others suggest that humans genetically inherited heuristics that favor prosocial behavior such as generosity, forgiveness or altruistic punishment (Ridley 1996, Bowles and Gintis 2004, Rolls 2005).

We argue these mechanisms are not genetically inherited; rather, they are features inherited through cultural selection. To support this view we invoke *inclusive fitness theory*, which states that individuals tend to maximize their inclusive fitness, rather than maximizing group fitness. We further reject the older notion of natural group selection - as well as more recent versions (West, Mouden, Gardner 2011) – which hold that natural selection favors cooperators within a group (Wynne-Edwards 1962). For Wynne-Edwards, group selection leads to group adaptations; the survival of individuals therefore depends on the survival of the group and a sharing of resources. Individuals who do not cooperate, who are selfish, face extinction due to rapid and over-exploitation of resources.

Alongside our assumption that prosocial behavior is not genetically inherited, we claim that prosocial strategies enhanced by cultural selection presuppose a biological background that – following the central idea of natural selection – requires biological justification to explain cultural evolution. In spite of the selfish tendency prevalent at the levels of genes and the individual described by inclusive fitness theory, and kin selection in particular, natural selection may permit and even promote group benefits. However, the intensity of pressure to develop cooperation and the ability to cooperate depends on the species in question. Humans are mutually dependent;

accordingly, ultimate group benefits may override the survival claims of individuals who otherwise favor their private, selfish interests. While this approach is correct in theory, we question its validity because human society is not, for example, a superorganism akin to colonies of social insects. This can and does result in individual inclusive fitness superseding group fitness. Respect for the rights and benefits of others requires support by the cultural group. As such, this involves a form of a cultural selection of beneficial, individuated factors that are beyond the horizon of natural selection.

## 2.

We make the assumption that natural selection usually favors selfishness, and that, in turn, this selfishness must be neutralized by cultural selection. However, the topic is more complicated and somewhat paradoxical. For example, despite the inherent selfishness of natural selection, an individual may possess features that do not benefit him individually (Okasha 2006, p. 11). In this sense natural selection favors mechanisms that increase an individual's chances for survival, yet these mechanisms may be *more* beneficial to the group than to the individual, by virtue of promoting prosocial and altruistic, rather than selfish, behaviors.

To illustrate such promotion of prosocial trends, we refer to the theory of the origin of property rights proposed by Herbert Gintis. In his concern for the dominant role played by cultural selection on the evolution of cooperation and prosociality, Gintis points to property rights as being deeply rooted in natural selection and in particular, the phenomenon of territoriality in animals (Gintis 2013). Accordingly territoriality provides one possible and observable explanation for property rights in the evolutionary continuity of behaviors from non-human animals to humans. It ought to be noted, however, that older behavioral patterns that evolved by natural selection can be transformed or neutralized in later developmental stages under selective pressure. Specifically, strategies that were appropriate for small groups in the Pleistocene period were no-longer appropriate, and therefore not inherited genetically or culturally, in the strategies developed during the Holocene period following the Agricultural Revolution. This, we claim, applies equally to the evolution of property rights, which in their myriad current cultural forms do not necessarily reproduce or resemble phenomena of territoriality among nonhuman animals, yet involve degrees of translation invoked by the continual development of strategies.

'The biological formula of territorialism', claims Edward O. Wilson, 'translates easily into the rituals of modern property ownership. . . Each culture develops its own particular rules to safeguard personal property and space' (2001, p.105). Property rights are one of the most important tools for the evolution of cooperation in large groups, and are accordingly informed by a combination of both natural and cultural selection. On the one hand, they are rooted in animalistic territoriality; on the other, they are the result of cultural selection which is crucial for the development and stability of group cooperation, alongside other cultural phenomena such as religion, division of labor, trade, ethics, folklore and gift giving.

Cultural group selection is crucial to the development of cooperation and the stability of prosocial norms. This contrasts with the basic mechanisms of natural selection - kin selection, direct and indirect reciprocity - that do not promote cooperation. Specifically, these mechanisms are not sufficient for cooperation at the level of large groups, although they do work sufficiently at the level of small groups, such as families (kin). This is because they require stable and constant conditions that are usually impossible to achieve within large groups. As Martin Nowak maintains, natural selection favors lower levels of competition rather than defectors and cooperators (Nowak 2006). Hence the development and increase of communal human sociality

facilitated by cultural phenomena that reflect the natural biases which have evolved via natural selection to living in stable and small groups. We reject Nowak's suggestion, however, that the tendency towards natural cooperation is a fundamental principle of evolution – his third principle of evolution beside mutation and natural selection (Nowak 2006). It is not clear, for example, whether cooperation can be interpreted as a feature of natural selection; while different modes of cooperation might seem beneficial to human development, cheating, deception, and associated forms of mimicry rely on modes of cooperation that are clearly unfavorable aspects of cooperation.

### 3.

Natural selection cannot work sufficiently at the higher levels of social organization. Examples of wrong or harmful biases in human societies, for instance, archaic intolerance or aggressive behaviors, are the result of these old evolutionary features (Eibl-Eibesfeldt 1997). The increase in size and volume of contemporary societies has been paralleled by different modes of inter-group competition, including brutal wars and conflicts, which enforce social agreement and basic levels of harmony and cooperation. A central feature of the conflicts and different modes of inter-group competition that facilitates the evolution of cooperation is, we argue, the notion of property rights.

The intensive and dynamic development of large human communities after the Agricultural Revolution points to the dominant role played by cultural selection. This development did not meet the criteria needed for and thus differs from natural group selection, criteria including survival in small groups, intensive selective pressure and very limited inter-group migration. Development of human populations during the Holocene period was often characterized by intensive inter-group migrations that were a significant obstacle to the development of new adaptations otherwise evolving by natural selection. To clarify this point further it is necessary to distinguish between cooperation at small and large group levels, which require different mechanisms.

Cooperation in small groups works on the basis of mechanisms that have evolved by natural selection. Kin selection (especially Hamilton's rule) for example, as well as inclusive fitness theory, direct reciprocity (first of all, tit for tat's rule) and indirect reciprocity (especially the leading role of the concept of reputation). We argue that cooperation in small groups between unrelated individuals is the result and the relict of Hamilton's rule ( $r > c/b$ ) and family-like groups. This latter mechanism is associated with the past human tendency for living in small groups of mutually dependent individuals, for example, small communities of hunter-gatherers and foragers during the Pleistocene period. It seems, however, that the concept of 'fictive kinship' can also be useful for cooperation in larger groups (Atran, Henrich 2010, p. 19).

Hamilton's rule states that the coefficient of relatedness ( $r$ ) must exceed the cost-to-benefit ratio of an altruistic act ( $r > c/b$ ). In this context altruism may be technically understood as a term associated with cooperation, because cooperation often requires a limitation of the benefits of the gene in favour of benefiting the gene or group. If we underline the difference between altruism and cooperation that was mistakenly identified by Robert Trivers and his idea of reciprocal altruism (Trivers 1971) however, it seems more appropriate to apply our association between altruism and reciprocity or reciprocal cooperation.

Cooperation between humans usually provides mutual benefits; however, it may cause greater benefits for one agent than for another. It is not clear whether this asymmetry should be interpreted as a form of altruism or a form of deception or cheating. There is a third possibility: a

connection between direct and indirect reciprocity. Unequal cooperation *within* direct reciprocity could be influenced by the notion of reputation appropriate to indirect reciprocity. Here indirect reciprocity could strengthen individual inclusive fitness despite formally altruistic behavior. Reputation in this context is understood to mean care about one's own reputation rather than knowledge of someone else's reputation.

The current trend for living in large groups appears to require a reversal of Hamilton's rule:  $r < c/b$ . Nevertheless the overriding problem remains: large group level social organization falters or simply does not work. However, under another basic mechanism of natural selection (tit for tat's rule), which states that the probability of another encounter ( $e$ ) between the same agents must exceed the cost-to-benefit ratio of an altruistic act:  $e > c/b$ , humans may act cooperatively and altruistically. This potentially offers a solution to at least some of the ills of large group organization that Hamilton's rule does not resolve. If, however, cooperation at the level of large groups can be explained via the third fundamental mechanism evolved by natural selection - by indirect reciprocity and the concept of reputation - we can also factor this into the consideration of the rule. This mechanism claims that the probability of knowing someone's reputation ( $p$ ) must exceed the cost-to-benefit ratio of an altruistic act:  $p > c/b$ . Indirect reciprocity includes 3 x R rule's (reputation, reciprocation, and retribution, as well as retaliation and repetition). We must take seriously, however, the reservation that in large contemporary communities an agent does not necessarily know anything about the reputation of other agents. Many relations are not stable, and the likelihood of knowing someone's reputation is low or impossible.

In sum, there are three basic mechanisms of natural selection that may support cooperation in small groups involving related individuals. In the case of unrelated individuals, at least two conditions are required: small, stable groups, which are connected with repetition of encounters and care for and about reputation. Within the scope of the present epoch (Holocene), there is unlikely to be enough time within the present evolutionary period to prepare new evolutionary adaptations able to resolve the issues relating to cooperation in large groups. As such, humans still require the support of culture and specific cultural mechanisms to address and remedy these issues. The idea of a social contract, for example, may confirm the dominant role played by culture in helping to approximate, if not always achieve, peaceful living in large social groups (Rolls 2012).

#### 4.

The large societies of today are markedly different from the small communities of foragers in the late Pleistocene period. Consequently it seems unlikely that old behavioral patterns are able to explain strategies in the new era. Indeed, some patterns that were either important or indispensable during the Pleistocene period may today be at best anti-social and at worst fatal: for example, the tendency towards useless aggression or an archaic intolerance against the 'stranger' or 'other' (Eibl-Eibesfeldt 1997). The current refugee crisis in Europe, and in particular the attitudes and behaviors among some Europeans, is arguably an illustration of antagonistic behavior that can be traced back to older evolutionary mechanisms associated with the phenomenon of territoriality, namely fear and aggression that suited small closed groups. Cultural group selection has, therefore, to function primarily as a means of mitigating or overcoming these mechanisms at the level of kin and small groups.

Following the philosophical tradition prior to David Hume, we can assume a controlling moral nature attributable to reason. Reason was able to evolve under selective pressures within the framework of large groups, precisely because living in these groups required cooperation

between unrelated strangers as a basis for survival and mutual dependence. It seems human intelligence in particular, and not emotions or intuitions, has enabled the adaptation of environments to human needs (John F. Kihlstrom). In this landscape property rights are one of the significant exceptions, insofar as they bridge the natural selection of the Pleistocene period and the type of cultural selection we experience today (Holocene). We claim, as Matt J. Rossano does, that culture is an important force that drives human evolution (Rossano 2010, p. 153), and key to that evolution has been and continues to be property rights.

Central to the assertion of property rights through cultural evolution, yet equally notable with regard to other evolutionally frameworks, is the determination of what those rights entail, allow or facilitate between individuals or groups: specifically, the right of the individual or group to use, abuse and alienate property over which legal title is held. This culture of transaction, transfer or conveyance of property brings individuals and groups together both in legal and social relationships. As such, it raises fundamental social, political and psychological issues that impact on all human relations – that is, the issue of how to negotiate with or confront the other and otherness more generally. Moreover, attitudes towards the ‘other’ often evoke questions of trust. The transition of trust from a small in-group level to the level of large groups is difficult for natural selection to bring about. Cultural group selection, especially via the legal system, is able to supplement or reinforce what is otherwise a difficult evolutionary problem by enforcing certain behaviors, duties and obligations considered necessary, acceptable or, in some cases, of benefit to the state or community, or to a particular individual or group. From an evolutionary standpoint we may posit this as a form of socially mandated control used for the survival of all groups of unrelated strangers, conducted via the vehicle of property, and the offer and acceptance as to the validity of property rights in particular.

## 5.

Cooperation helps in instances of both natural and cultural selection to enforce and thus guarantee the survival of a group. Natural selection, however, may favor the lowest cost mechanisms available, such as cheating and imitation. As a result, human communities face a constant problem with cooperation insofar as it is always already balancing on a tension between natural and cultural selection (Boyd and Richerson 2009). Human evolution has long witnessed a simmering conflict between older kin, and newer cooperative social instincts caused by deeply rooted parochial altruism (Rusch 2014). Personal conflicts of this nature necessarily lead to breaches of the law and different types of cheating and deception within large communities, largely because natural selection does not evolve trust and loyalty towards unrelated strangers.

This problem is deeply rooted in the basic strategy of natural selection, which otherwise favors low cost mechanisms and strategies. Moreover, natural selection favors *imitation* of cooperation and altruism rather than real cooperative and altruistic behavior; in order to achieve real cooperation additional stimuli are required. However, such stimuli are not automatically found in biological biases. Benefits for the individual (at the level of phenotype) and for the group can supersede benefits for the gene. But such a replacement, especially in the case of group benefits, usually requires an extra-biological activity as, for instance, a rational route to action via cultural phenomena.

Cooperation at the level of large groups can be interpreted as non-natural human activity because humans, in light of inclusive fitness theory, should prefer low cost strategies. Individual inclusive fitness is an old and basic evolutionary mechanism; yet the more recent behavioral strategies that have evolved since the Pleistocene period can still bear hallmarks of their

translation into the present epoch (Bowles and Gintis 2003). Indeed, cultural modifications were needed to enable the emergence of newer behavioral patterns; one such modification was the phenomenon of individual and social value attributable to material resources. This, as Kim Sterelny notes, informs the notion that accumulation and inheritance of material resources have helped determine development of cooperation during the Holocene period (Sterelny 2013).

The most important phenomenon of cultural group selection is associated with the development of legal systems. Law has been a necessary feature of almost all social groups since the period of the Agricultural Revolution, when humans went from foraging to farming. Indeed, law, along with other significant yet basic elements including, for example, language, has been posited as *ab initio* human social life (Wilson, 2001, p.22). We interpret law as a phenomenon which is or can be strictly connected with the type of accumulation and inheritance of material resources mentioned above. Further, an important practical concern for the cultural evolution of human life was the necessity to regulate and manage accumulations and inheritances, and both law and legal systems fulfilled the function as required.

However, law did not enjoy this privilege exclusively. Religion also oversaw the regulation of accumulations of material resources and goods, but did so in terms of a stricter or more pronounced and explicit moral framework. Worth noting in the context of Common Law systems, such as England and Wales, is the inclusion of Courts of Equity that brought together the two distinct yet complimentary and dialogic domains of religion and law; further, did so specifically for the purpose of servicing property regulation and management, as well as allowing for a more discretionary and flexible means of property-right creation than the Common Law deemed possible (Worthington, 2006).

Law is made possible by at least three human abilities: language, abstract thought and long-term planning, which collectively exceed short-term animalistic capabilities. Language in particular is crucial to law's contribution in this area of evolution because it enables the dissemination of information and the ability to warn, both of which are important for the concept of reputation within indirect reciprocity. Moreover, language confirms the importance of rationality and reasoning.

It is not clear, however, how intuitionism connects with rationalism. On the one hand, humans are determined by their emotions and intuitions (Haidt 2001, Waal 2013). The concept of universal moral grammar (Mikhail 2007) and the alarm-like emotional reactions, especially in terms of personal moral dilemmas, are familiar. For example, the evolutionary origin of these alarm-like emotional reactions in the phenomenon of warning calls in animals arguably translate to analogous human reactions. On the other hand, a rational background is essential for planning, evaluation, reputation, signaling or for systems of reward-punishment. On this basis, it might be assumed that legal systems have played and continue to play a role in providing a rational framework for, *inter alia*, the containment and management of emotions and intuitions. Further, specific legal mechanisms - trusts for example - arguably exceed mere containment and management of emotions and intuitions, acting instead as engines of desire capable of producing emotions, behaviors and intuitions (Herian, 2016).

Despite the high evolutionary cost of rationalism, intuitions and emotions do not fully determine human behavior, which is otherwise shaped by beliefs and expectations requiring thought and deliberation. Despite the important role played by intuitive mechanisms, rationality and reasoning remain the crucial mechanisms for the evolution of cooperation. Reasons for cooperation with unrelated individuals require powerful arguments against the natural tendency to associate with kin and within small groups. These cultural differences in the level and quality of cooperation are influenced by selective learning and cultural institutions (Chudek, Zhao and Henrich 2013). An important argument for the leading role of cultural group selection, and especially for

the role played by legal systems in the evolution of cooperation, is the feeling of indifference towards unrelated individuals (Szocik 2014). This feeling, which evolved by natural group selection, cannot be considered either good or bad when it comes to attitudes towards others; rather, cultural phenomena decide which strategy should or will be favored by individuals.

As we claimed earlier, religion, alongside law, acts as a crucial proponent for the evolution of cooperation - however, only insofar as the religion is able to overcome significant developmental obstacles of its own that can broadly be associated with cultural evolution, and which, as Wilson maintains, make religion similar to any other human institution 'in that they evolve in directions that enhance the welfare of the practitioners' (2001, p.167). Some researchers, such as Ara Norenzayan, suggest the main feature of religious beliefs and institutions was to introduce the idea of being watched (Norenzayan 2013). Watched, that is, by a supernatural, omnipotent agent with privileged access to information and knowledge; one capable of controlling the lives of all people, judging them, and defining the terms of eternal punishment and reward. This concept of God as a supernatural judge and observer is an attractive theoretical explanation of the alleged social and moral function of religion and religious beliefs. Moreover, the idea or fear of being watched can, when translated into secular and profane modalities of power and control - the likes of which we find in Jeremy Bentham's infamous *Panopticon* - be recognized as a form of omniscience employed as much by modern and contemporary legal and political institutions as it is, or has been, by religion.

Yet, while it is often incorporated into theories that attempt to explain the origins of cooperation at the level of large groups, this feeling of being watched enhanced by religious beliefs does not work sufficiently in the context we outline here. Rather, the power of religious motivation for cooperation is better understood as being rooted in religious *divisions* of people into different *antagonistic* groups. Such religious ordering works on the basis of parochial altruism referred through in-group love and trust, and inter-group rivalry and conflict. Further, while the important role played by religion and religious beliefs was built on tribal psychology and inter-group boundaries, this impact was crucial for the development of humanity towards cooperation *only* because it has enabled in-group solidarity and cooperation. The correlation between religion, religious beliefs, rivalry and conflict offers us a good example of the dual inheritance theory, and interaction between natural and cultural selection. Within this model religion strengthens inclusive fitness (Crespi and Summers 2014), and in this sense plays a similar role to the legal systems in going beyond the primary level of a kindred circle, promoting the need for trust between wider groups of unrelated humans.

## 6.

Cooperation at the level of large groups has been problematic since the Agricultural Revolution. Communities of hunter-gatherers who lived in the period before the Agricultural Revolution were, by contrast, notably egalitarian (Seabright 2013, p. 109). These communities enjoyed a social structure that was relatively free from the types of social and political troubles commonly associated with the farming and agricultural societies that emerged later. It was, accordingly, the adoption of agriculture that created the necessity for, *inter alia*, armies and legal systems capable of protecting and maintaining certain prescribed hierarchies. Moreover, this new form of social ordering included the development of institutions of coercion that helped entrench hierarchical norms within the emerging agrarian societies. Of note is that the emergence of hierarchies required or relied upon cultural phenomena that could be used to stabilize social cooperation, and thus legitimate their own positions.

Paul Seabright notes that the origin of hierarchy can be explained by one of four hypotheses. Firstly, the implementation of coercion is based on the threat of exclusion from the community; as the chances of survival for an individual who had been excluded from the community were lower, this motivated and necessitated subordination to the will of the community. Concern for survival is thus a factor influencing individual subordination to social and communal ends. If this hypothesis is correct, high mortality rates among excluded humans would, for example, work as a means of enforcing internal discipline within communities.

Secondly, the production surplus made possible by agrarian strategies can be seen as proportional to the strength of the agrarian armed forces, enabling those communities to enforce an advantage over smaller egalitarian groups of foragers. Thus, the advantage that agrarianism offered in contradistinction to egalitarian communities was the number of fighters and hence relative force. Conversely, however, some of the skills shown by foragers, for example, those involving mobility and morale, arguably better prepared them for conflicts over territory and resources.

Seabright's third theory relates to the importance of social sacrifice by part of the group for the benefit of the whole; that is, a form of parochial altruism based on in-group love and out-group hate and hostility. Seabright underlines, however, that the motive to sacrifice is stronger within smaller egalitarian societies than in larger hierarchical communities. What is more, it is not clear why the emergence of agriculture caused the development of features and emotions appropriate for parochial altruism.

The fourth and final interpretation associates the idea of parochial altruism with the institution of slavery, insofar as defeated men could be used as workers. This form of coercion, it is argued, was possible only after the emergence of agriculture (Seabright 2013, pp. 113–114). In order to confirm this hypothesis, however, it is necessary to prove the existence of slavery in the late Pleistocene period, thus before the emergence of institutions of coercion, namely law. Also finding preliminary factors which influenced the tendency to create hierarchies before the emergence of institutions of coercion is equally important.

In this evolutionary landscape, property rights are able to explain, in part, the interconnection of traits that are suitable for both natural and cultural selection. And whilst philosophers are especially interested in the social and economic roots of the concept of property in modern times, we nevertheless take seriously arguments that maintain that the evolutionary roots of property rights can be traced to the territoriality of animals. For example, nonhuman primates have a greater respect for possessions than humans, although, of course, it is important to remain mindful that property rights, as they are conceived in the legal systems of modern societies, do not turn solely upon possession, but rather upon more formal concerns bestowing ownership and title. Further, in the animal world, the struggle for life usually favors individuals who observe a property equilibrium over individuals who prefer an anti-property equilibrium. At the same time, a property equilibrium may be undermined by low fighting cost and high cost of migration. It appears that humans share this property equilibrium with other animals, one that may be interpreted as a feature inherited through natural selection.

Humans also seem to have inherited the strategy of 'loss aversion', meaning that there is a stronger tendency for an owner to defend his property than the commitment by an intruder to take property. At its core, loss aversion is influenced by the 'endowment effect', meaning that an individual places greater value on property that he actually possesses (owns) than property he does not possess. Loss aversion and the endowment effect, both of which help explain why tangible property and the more abstract notion of property rights are determinable via an association with notions of *vital resource* and what is *economically defensible*, are important natural biological factors that are deeply rooted in the animalistic, nonhuman behavior of territoriality.

These factors constitute an evolutionary foundation on which the institutions and systems of property rights have been built. This is especially the case if we consider, *inter alia*, tangible property or property rights existing or residing within, what Wilson calls, ‘an invincible center’, whereby the ‘resident animal defends the territory far more vigorously than intruders attempt to usurp it’, with the ‘result the defender usually wins’ (2001, p.103). In the period before the institutions of coercion and social contract, both of which are culturally founded and transmitted, a phenomenon of natural property founded on natural mechanisms favored by natural selection arguably prevailed. Yet, in repelling an intruder the defending animal enjoys, as Wilson argues, ‘the “moral advantage” over trespassers’ (2001, p103). If we take seriously that the ‘moral advantage’ of which Wilson speaks prefigures an ethical and customary framework capable of evolving and developing into a system of fixed rules and self-edifying doctrines, we may appreciate that property (including its accumulation and defense) is not merely something to be administered *by* law, but itself provides a stimulus *for* law.

## 7. CONCLUSIONS

The aim of this article was to explore the biological and evolutionary roots of property rights. The assumption on which this exploration was based was that humans are subject to biological *limitations* regarding their selfish tendencies, albeit limitations based on deeper selfish mechanisms. In this case, such mechanisms include the self-regarding cost-benefit analyses made by potential intruders who seek to misappropriate property belonging to another. It is worth keeping in mind that respect for ownership on this basis is not the result of moral reasoning, although it can give rise to a moral condition; the endowment effect better explains the respectful condition - an effect that is very strong in the animal world, where a smaller group of incumbents are usually able to defend territory (for example, a resource of fresh water) against a larger group of intruders.

Property equilibrium is a core feature of natural selection because it gives an advantage to a group that shares in such an equilibrium over one that does not. Moreover, an anti-property equilibrium has a lower payoff (Gintis 2013, pp. 118–119, 123, 125). Humans and animals display similar behaviors of ‘loss aversion’, inasmuch as they show a strong commitment to defending their own property when it is threatened by an intruder. In this sense, these rights are sacred and inviolable because they are deeply rooted in biological biases that have evolved through natural selection.

Besides their natural origin, property rights can also be interpreted in traditional ways, as a phenomenon of cultural group selection used to build cooperation at the lower (in-group) and higher (out-group) levels of competition. The development of legal systems, including a system of property rights, has been influenced by conflicts and cooperation on this basis. Conflicts and cooperation were and still are the domain of two opposing forces: natural behavioral patterns of ‘loss aversion’, kin altruism and direct reciprocity on the one hand, and environmental conditions in the present epoch on the other. These conditions led to the development of the cultural tools required to replace cooperation within small kin groups with cooperation and common living in larger groups of unrelated individuals. Central to these evolutionary stages are property rights which, as a strong natural force evolving by natural selection, remain deeply rooted in nature, whilst equally asserting cultural influence as foundations for modern laws.

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