



On the origin of laws by natural selection

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ABSTRACT

Humans are lawmakers like we are toolmakers. Why do humans make so many laws? Here we examine the structure of laws to look for clues about how humans use them in evolutionary competition. We will see that laws are messages with a distinct combination of ideas. Laws are similar to threats but critical differences show that they have a different function. Instead, the structure of laws matches moral rules, revealing that laws derive from moral judgment. Moral judgment evolved as a strategy for choosing sides in conflicts by impartial rules of action—rather than by hierarchy or faction. For this purpose, humans can create endless laws to govern nearly any action. However, as prolific lawmakers, humans produce a confusion of contradictory laws, giving rise to a perpetual battle to control the laws. To illustrate, we visit some of the major conflicts over laws of violence, property, sex, faction, and power.

1. Introduction

Let us ponder down a path from the evolution of the human mind all the way to laws, governments, and societies. On such a long trek, we may become lost and separated at times but remember we are here to enjoy the views and to invigorate ourselves by struggling with immense perplexities. If we discover anything of use, it will be more than we could have hoped.

We will travel light to keep a brisk pace and focus on ideas and arguments. Set aside for a moment the heavy jargon and weighty traditions that have amassed on these subjects. Rest assured, we will return at the end to review numerous literatures under Notes. The Notes follow the sections of the article and review literature on each topic in order.

Modern societies depend on governments. Governments are made of laws. Therefore, if we can understand how and why an animal, *Homo sapiens*, makes so many laws about so many things, we will have come a long way toward our destination.

2. What are laws?

We might assume that laws are what is written in law books. But a lawmaker who writes a law must have thought of it first. It may not be *the law* until it has been written and enacted, but it is *a law* in the mind of its author. Laws appear in the mind before they can appear in a book.

Besides, it is too arbitrary to limit laws to what is in books and courts. Humans evolved 300,000 years ago and only a few societies from a few millennia have books and courts. Should we by the stroke of a definition

deny our human ancestors the possibility of something so fundamental as laws? Laws might even have governed the societies of *Homo erectus* for millions of years before our species. Moreover, children critically debate the rules about what they can and cannot do. It seems odd to say that a child's rules about pushing and stealing are not laws, yet the same rules would be laws if the child became a lawmaker and wrote them down. Laws are part of our human heritage along with language, tools, and art. We do not limit art to what is in museums.

Still, laws gain new force when they are cast in writing and mounted upon sacred tomes. The force is so distinct from spoken law that we could reasonably reserve the word *law* for just this circumstance. So let us acknowledge a continuum from the written laws of governments to the spoken rules found in all societies, particularly the moral rules bound by the force of punishment like their written counterparts. What is critical is that all laws, written or spoken, come from the mind, and from the same stock of ideas, differing only in expression by the tongue or the pen.

2.1. The ideas that laws are made of

We therefore turn to the science of the mind, psychology. In particular, cognitive psychology studies the mental representations—the ideas—that we use to think, learn, and communicate. And evolutionary psychology studies how humans use specific ideas to prosper in nature and society. Drawing on these fields, we ask: what ideas are laws made of, and why do humans make them?

To uncover the cognitive psychology of laws, we begin with the

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language that people use to express them. Here is why language can lead us to the ideas that compose laws. Generally, words are symbols for ideas, and sentences symbolize complex ideas by combining words according to the rules of grammar. The meanings of words are arbitrary conventions, such as uttering *bird* to refer to a kind of flying animal. But a word points to an idea that is not arbitrary. The idea of a bird represents our knowledge of birds such as their appearance and habits. This knowledge is not arbitrary but refers to real birds. We could swap the words *bird* and *fish* without losing knowledge, but if we swapped the ideas for bird and fish, we would think that a goldfinch swims and a goldfish flies. The sound *bird* invokes the idea that encodes our knowledge. This is why the same idea can be expressed in other words in the same language and different languages, such as the Latin word *avis* for bird, because different symbols point to the same idea. Thus, we can think like a cognitive detective and follow language like footprints to find the ideas behind words and sentences.

Accordingly, to better understand laws we can study their words and grammar and ask what ideas these symbols express. Consider this example of a law against murder from a book of laws, the Code of Laws of the United States:

Whoever is guilty of murder in the first degree shall be punished by death or by imprisonment for life.

What is this specimen of idea before us? Let us dissect the words and phrases to see what ideas they signify, proceeding roughly to get the general sense. We see a statement, including a subject, verb, and object, like other sentences. The subject is *whoever*, a person who, the next phrase qualifies, *is guilty of murder*. This unspecified person murdered someone, also unspecified. Thus, we have a rule about a person in a category defined by the action they performed, *murder*.

Already the statement is complex. The subject does not refer to a person from an event that we see or remember, such as *Romulus murdered Remus*, but to an unspecified murderer. The difference parallels the distinction between numbers in arithmetic and variables in algebra. The variable x can be many numbers, and *whoever murders* can be many people. To contemplate such possibilities, we augment our perception with the faculties of reason, logic, and imagination.

Also, *whoever* suggests the idea of impartiality. Impartiality means the law applies to everyone who murders, whether family, friend, ally, or king. The phrase *is guilty of* alludes to the ideas of truth and evidence. Suspicion and rumors are not enough. The person must be proven guilty with evidence. And *in the first degree* adds that the person murdered with intent and malice, summoning our ideas for mental states such as wanting, knowing, and planning.

Having considered the subject, we now come to the verb, *shall*, and its complement, another verb phrase, *be punished*. *Shall* takes us again to the realm of possibilities, this time to narrow them to a pointed necessity: whoever murders *shall be punished*. If someone thought they might not be punished for murder, *shall be punished* eliminates such hopes.

Shall and *must* come from a special class of verbs called modal verbs, which refer to a special class of ideas that represent possibilities. Modal verbs also include *can*, *may*, *will*, *might*, *could*, *would*, and *should*, along with their negations such as *shall not*, *must not*, and *cannot*. These verbs express possibilities of any kind, including physics, a log *can* float; biology, a nightingale *can* sing; and law, a person *can* buy land. And they express different kinds of impossibilities: a stone *cannot* float, a turtle *cannot* sing, and a person *cannot* murder.

Invariably, modal verbs like *can* and *must* act upon another verb such as *float*, *sing*, and *murder* to form a complex idea. Generally, verbs construct ideas of a higher order by acting upon people and things to represent an event. For instance, in *Romulus murdered Remus* the verb *murder* represents an event formed from the simpler ideas, *Romulus* and *Remus*. However, the modal verbs act on simple verbs to reach a higher plateau. *Can*, *may*, and *must* lift our view beyond one event to contemplate many possible events. In *Romulus can murder Remus*, *can* acts on *murder* to represent the event as one possibility among many. Likewise,

the negation *cannot murder* calls on the idea of possibilities to deny that murder is among them. And the necessity *must murder* asserts that murder is the only possibility. Thus, modal verbs form a complex idea about possible events, an idea which stands above the event itself, which stands above the people and things within the event.

So returning to the law, the *shall* in *shall be punished* raises the idea of possibilities to assert a single one: The murderer's fate is to *be punished*. Specifically, they shall be punished *by death or by imprisonment for life*, implying the idea that the penalty should be proportionate, a life for a life.

Punishment explains why laws so commonly use *shall*, *must*, and other words about possibility. When we say that a person cannot murder, we do not mean that they are physically incapable but that they cannot murder without being punished. In laws and threats the relevant possibilities are actions free from punishment. What someone *can* do is not punished, what they *cannot* do is punished, and what they *must* do is the only action that is not punished. The specter of punishment transforms the possible to *permissible*, the impossible to *forbidden*, and the necessary to *obligatory*. These words refer to the same idea of possibilities found in *can*, *cannot*, and *must* but in the form of adjectives, where the second in each pair specializes in the possibilities of punishment.

We therefore find within one law a wealth of ideas. They include indefinite people, actions, intentions, truth, impartiality, possibility, necessity, punishment, and proportion.

2.2. Endless wrongs most punishable

The same ideas appear in law after law. They are often expressed in the words we have discussed. For instance, the Constitution of the United States uses the verb *shall* 192 times in four pages. The president "shall be removed from Office on Impeachment for, and Conviction of, Treason, Bribery, or other high Crimes and Misdemeanors." And, "No State shall enter into any Treaty, Alliance, or Confederation."

The same ideas are also expressed in other words, including synonyms, different parts of speech, and different points of view. For instance, the idea signified by *must* appears in adjectives such as *obligatory*, *requisite*, and *mandatory*, nouns such as *obligation*, *requirement*, and *duty*, and verbs such as *obligate*, *require*, and *compel*, which take the perspective of the authority who *obligates* as opposed to the person who *must* perform the duty. These and other forms of *must*, *can*, and *cannot* refer to the core idea of possible actions limited by punishment.

While laws draw repeatedly from a common stock of ideas, they vary enormously in the actions they regard. Murder, theft, trade, marriage, sex, treason, blasphemy, alliances, witchcraft, dance, astronomy, royal succession, elections, taxation, abortion, inheritance, health care, hunting, imprisonment, and the act of lawmaking itself—these actions and many more occur in laws. Nearly any action we can describe, including the whole catalogue of verbs for intentional actions, we could make a law to forbid or allow. Just as our language can express an infinite variety of ideas, owing to the power of verbs, so too can our laws govern an infinite variety of actions.

Consider the themes and variations in a sample of laws. The ten laws presented in Table 1 come from Exodus in the *King James Bible*, both an ancient book of laws and a translation that served as an early standard of modern English.

We find in each case an unspecified person in forms such as *whosoever*, *a man*, and *thou*. Four laws use *if* to form a conditional statement, which is another way to express possibilities, particularly the consequences *if* a possible event occurs.

All ten laws use the modal verb *shall*, mostly in the sense of *must*. *Shall* operates on the person's action, as in *shalt not steal*, and the punishment, as in *shall surely be put to death*. Indeed, in Exodus the main chapters about laws (20–23) repeat *shall* and *shalt* 154 times in 6 pages, averaging 26 times per page.

Following *shall* or a similar expression, we have the most variable component, the person's action. Here the actions include: eat, work,

Table 1
Laws from Exodus, King James Bible.

Whosoever eateth leavened bread from the first day until the seventh day, that soul shall be cut off from Israel. (12:15)
In the seventh day there shall be an holy convocation to you; no manner of work shall be done. (12:16)
Thou shalt not steal. (20:13)
If he take him another wife; her food, her raiment, and her duty of marriage, shall he not diminish. (21:10)
He that curseth his father, or his mother, shall surely be put to death. (21:17)
If a man shall dig a pit, and not cover it, and an ox or an ass fall therein; the owner of the pit shall make it good, and give money unto the owner. (21:33–34)
If a man shall steal an ox, or a sheep, and kill it, or sell it; he shall restore five oxen for an ox, and four sheep for a sheep. (22:1)
If a man entice a maid that is not betrothed, and lie with her, he shall surely endow her to be his wife. (22:16)
Whosoever lieth with a beast shall surely be put to death. (22:19)
He that sacrificeth unto any god, save unto the LORD only, he shall be utterly destroyed. (22:20)

steal, curse, dig, lie with, and sacrifice. Sometimes the actions have an object or condition, as when someone eats leavened bread, works on the seventh day, or lieth with a beast.

Notably, the action is much more specific than the person. While a law about *whosoever* applies to any person, a law about the action *steal* does not apply to any action, not to people who eat, curse, dig, and so on. *Steal* is much more specific than *whosoever*, as much as *fox* is more specific than *animal*. Thus, we can be more precise when we say that laws are general rules. The components differ in generality. The people are very general while the actions are more specific. This difference is critical because the specificity of the actions produces the infinite variety of laws.

We come next to the matter of punishment. Four laws condemn the offender to death or banishment. In three laws, the offender must compensate the victim with money, livestock, or in one case marriage. Note that the obligation to compensate implies further punishment for offenders who fail to do so. The remaining three laws such as *thou shalt not steal* imply a punishment but do not specify the penalty.

Among the smaller points, most of the laws regard actions that are intentional. The exception is leaving a pit uncovered, a case of negligence with a lesser degree of intent. Another law in Exodus (21:28–29) holds that if an ox gores someone, its owner does not deserve punishment, but if the owner knew the ox gored people in the past, then the owner must be executed. This law distinguishes owners who could and could not foresee the goring, drawing on the idea of foresight as a mental state to decide a matter of life and death. Finally, other laws in Exodus refer to the ideas of truth and impartiality, such as *thou shalt not bear false witness* (20:16), *thou shalt not raise a false report* (23:1), and *the innocent and righteous slay thou not* (23:7).

In general, we find the same themes and variations in the laws of society after society: the spoken laws of foragers, the Laws of Eshnunna and the Code of Hammurabi from ancient Sumer, the Tang Code from medieval China, the common law of England compiled in Blackstone's Commentaries, the Constitution of the United States, the Universal Declaration of Human Rights, mundane traffic codes, and so on. Observe, for instance, the elements of an English law from the Witchcraft Act of 1604:

If any person...use, practise, or exercise any invocation or conjuration of any evil and wicked spirit...then every such Offender...duly and lawfully Convicted...shall suffer paines of death.

In each case, we find rules about a general person who can, cannot, or must perform a specific action, and the rules are enforced by punishment. Humans combine these universal elements with variable actions to make infinite laws.

3. What are laws for?

Having seen the distinct ideas that compose laws, we next ask what laws are for. We want to know the evolutionary functions of each part and the parts in combination, as we would study the parts of an orchid's flower or a spider's web. The parts of laws are ideas in the human mind, just as the frame, radii, and spiral of a spider's web come from its mind before its spinnerets. Ultimately, we want to know how humans use laws in evolutionary competition.

In our search, we need to consider the whole history of the human species beginning 300,000 years ago, and the millions of years before as natural selection modified our minds. We cannot look only as far as written laws because they appear in just a few millennia, less than 1% of human history. Let us not see only 1% and forget 99% of humanity.

Our human ancestors lived in foraging societies with a few hundred people who knew each other well. In foraging societies, the laws are spoken, preserved as customs, and enforced by a close community with gossip, blame, and punishment. Like the laws we discussed earlier, the laws of foragers govern countless actions including murder, theft, marriage, sex, diet, work, sacrifice, sorcery, and many more. Foraging societies, then, are the natural habitat where the ability to make laws evolved, so there we will find what laws are for.

Knowing where to look, we can rule out functions that are peculiar to modern societies and agricultural societies, where laws were first written. For instance, humans do not make laws in order to write them in books, apply them in courts, or enforce them with powerful governments, because foragers do not have books, courts, or governments. And humans, in general, do not make laws to maintain order among millions of strangers, because foragers live among hundreds of people they know. To serve these modern ends, humans use inventions such as writing, courts, and prisons to express, repurpose, and innovate laws. These expressions contain precious clues, such as written statutes where our ideas of law are refined, distilled, and preserved like fossils. But the modern ends are not the evolutionary functions that explain why humans make laws, any at all, why laws have the parts we see, how the parts work together, and why we can craft laws for new purposes.

We can also look in our own communities to observe how people use spoken laws among the people they know. We may not be foragers but our personal lives repeat many of the same predicaments found in all human societies such as quarrels over violence, property, work, sex, marriage, and so on. Whenever we discuss rights and wrongs, what actions people may, must, and must not do, when we blame, shun, condemn, and punish wrongdoers, we continue the ways that humans have always used laws.

3.1. Laws are not only threats from a superior

Among the parts of laws, recall, we have a person who upon some condition is punished. From afar, this type of statement looks like a threat. Threats, too, take the form of conditional statements, such as: *If you come closer, then I will punch you*. If laws are threats, then their purpose should be easy to understand. Threats are ubiquitous in animals: gorillas beat their chests, lions roar, bears charge, hummingbirds dive-bomb, and caterpillars drum their mandibles at intruders. Theories from evolutionary biology explain how threats evolve and why they evolve so commonly, including theories about signals, warnings, fights, dominance, and hierarchies. Also, research in game theory studies threats as a basic strategy in conflicts, and the conclusions concur with evolutionary biology. Thus, if laws are threats, we can simply study these explanations to understand the purpose of laws, how laws evolved by natural selection, and where laws fit among the adaptations of animals. On the other hand, if laws are not threats, we would like to understand why not, and we will surely benefit by knowing the difference.

Briefly, animals use threats to reduce the harms of fighting, including losses in energy, health, and status. The threatener sends a signal that they plan to attack the opponent under some condition. Like other forms

of communication, natural selection favors threats when both the threatener and the receiver benefit from the threat. The threatener benefits when the threat persuades the opponent to retreat from a resource such as food or territory, sparing the threatener from the damage they would endure in a fight even if they win. More subtle, the receiver benefits if they retreat, particularly when they will probably lose anyway after a costly battle with a stronger opponent. Like other signals, if receivers did not benefit, they would evolve to ignore the threat, and then the attacker would not send threats, since they have no effect, and instead they would attack without warning.

The logic of threats stems from the key point that most fights are not pure conflicts, but hybrids of conflict and cooperation. In general, conflicts are situations where two or more players want different outcomes. Conflicts include pure conflicts, where the players want the opposite outcomes, and games with mixed motives, where the players partly agree and partly disagree on which outcomes are better. Fights usually have mixed motives, which is illustrated by the classic model of fighting, the hawk-dove game, in which the players disagree on who should get a resource, while they agree that mutual aggression (hawk, hawk) is worse than mutual peace (dove, dove). Even in ferocious battles, the opponents usually share a common goal to minimize the mutual harm to both sides. The threatener appeals to this common goal by alerting the opponent of their plan to attack, urging the opponent to comply for mutual benefit. Without this element of cooperation, the threat would be useless and foolish. In games of pure conflict like chess or poker, a player would not announce their plan of attack. Similarly, predator and prey are locked in pure conflicts, marking the critical difference between predation and fighting. Predators do not threaten prey. Their preferred mode of attack is stealth and ambush, the opposite of loud, blustering threats. The lioness stalks silently toward the zebra, and then she roars loudly at the hyena to defend the carcass.

To persuade the opponent, threats contain evidence of the threatener's force. A deep roar demonstrates a large body, a fierce snarl shows the fangs as weapons, and a sudden lunge displays speed and agility. When the first threat does not settle the conflict, the fighter may issue another threat with more evidence of their power. In many species, the fighters display threats in a ritual with escalating stages that successively convey more evidence at greater cost in energy and risk. For instance, in red deer, the stags progress from roars at a distance, to a parallel walk comparing body sizes, to wrestling with antlers. Animals evolve these elaborate threats to protect themselves from dangerous conflicts over resources that can be avoided.

In social animals like baboons and hyenas, most conflicts and threats occur between members within the same group. Opponents fight repeatedly, they remember who won, and the previous loser commonly defers to the winner to protect themselves. Thus the idea of dominance evolved in these species to settle conflicts that repeat. Further, as they fight in pairs to establish dominance, they mentally tally and combine the results of these matches to determine a hierarchy, where everyone ranks in status from the most dominant at the top to the most submissive at the bottom. Thus they evolved the idea of a dominance hierarchy, which social animals use to perceive, remember, and reason about the dominance relations in their group, such as using the hierarchy to deduce the power of opponents they have not fought. Critically, these animals use the concept of hierarchy to make new inferences about others' status, revealing that they not only behave hierarchically but also possess the idea of hierarchy (see Notes). Moreover, a motive to ascend the hierarchy evolved. Since they use dominance to resolve conflicts over resources, dominance rank itself becomes a valuable resource worth fighting for. Social animals fight not only for food, shelter, and mates but also to control an idea, namely the group's collective idea of ranks in the hierarchy. As a result, many conflicts have no visible resource at stake. In hierarchical species, the group stirs with a constant commotion of dominant grunts followed by submissive squeals and grins.

Having reviewed why animals, including humans, use threats in

Table 2
Differences between threats and laws.

	Threats	Laws
Conditional Form	If [event], then I will punish you.	If anyone [action], then they will be punished.
Person	you	anyone
Condition	event	action
Attacker	threatener	everyone
Punishment	coercive	proportionate

conflicts and hierarchies, we now consider whether laws are threats. Both threats and laws announce a plan to attack someone under some condition. But they have fundamental differences, summarized in Table 2.

First, threats address a definite person, while laws address an indefinite person. A threat applies to *you*, the person who receives the message. A law applies to *whosoever*, anyone who meets the condition, including the speaker who states the law. Just imagine how strange it would be if a lioness roared at everyone including herself. And unlike threats, laws are impartial. A lioness who roared impartially would threaten her own cubs the same as hyenas.

Second, threats set a wide range of conditions, while laws set specific actions as the conditions. The conditions of threats can be actions like stealing and lying. But threats also warn of other events, including events that the person does not perform or cause. For instance, threats include conditions like *if anything happens to my child* and *if I have to come back here*. And unlike laws, threats refer not only to categories of action but also to unique actions such as *if you do that again* and *if you say that one more time*. In contrast, laws set conditions that are specific categories of action. We do not form laws with conditions like *if anything happens to my child*.

Further, in laws the person's action must be proven with evidence. Truth is necessary. An accusation must be true in the eyes of the community to meet the condition. This differs from threats which do not require actions, evidence, or truth. The threatener alone judges if the condition occurred, whether they decide by evidence, rumor, or suspicion. Also, the prominence of actions in laws coincides with the prominence of mental states, because many actions build in ideas about intentions. For example, the action *steal* builds in the idea that the thief acted intentionally. Laws focus on intentions because intentions are built into actions, while threats are not as particular about actions and intentions.

Third, threats warn that the threatener plans to attack, while laws warn that everyone in the community plans to attack. In threats, the attacker is the threatener, *I*, as in *I will punch you*. In laws, the attacker is everyone in the community, which, crucially, includes the family and friends of the offender. This fact explains why statements of law often omit the punisher, such as stating that a murderer *shall be punished* which uses the passive voice in order to omit who will perform the punishment. We expect everyone to blame wrongdoers, as impartiality requires. Indeed, in some foraging societies, offenders are usually punished by their own kin, a custom meant to avoid retaliation between kin groups. In modern societies, punishment is also carried out by specialists who work in courts and prisons. We expect these professionals to punish offenders on behalf of the community so they represent everyone. In sum, unlike threats, laws are enforced by everyone in the community, not only the person who stated the law.

As a result, laws can be more dangerous than threats. When a dog barks or a bully threatens, we know *who* plans to attack us. But when someone states a law, we could be attacked by anyone and everyone. A law is like a threat from unknown threateners. If a dog could bark a law to their group, each dog would have to heed attacks from every other dog including their own kin. Hence, once laws evolved in humans, they confronted a new danger of attacks from unknown attackers. For protection, special defenses evolved in response, including a conscience

which motivates humans to comply with laws even when we do not know *who* compels us to do so.

Fourth, threats set punishments that are coercive, while laws set punishments that are proportionate. In threats, punishment aims to efficiently compel the opponent by inflicting the most damage at the least cost in energy and risk. For instance, threateners often enforce their demands with severe and cruel punishments. Threateners can also soften or forgo punishment as they wish. But in laws, we expect the punishment to be proportionate to the crime, meaning worse crimes deserve harsher punishment. Indeed, excessive punishment is itself a crime deserving punishment. Also, punishment violates impartiality when it is harsher for enemies and more lenient for friends. So unlike threats, laws set punishments that are proportionate, neither too cruel nor too lenient.

Altogether, these fundamental differences tell us that laws are not ordinary threats. They share a similar structure and perhaps laws descended from threats, but laws have different parts that require a different explanation. Evolutionary theories of threats do not explain why an animal would roar at everyone including herself, why the roar refers to a category of action and requires evidence, why everyone attacks an offender rather than only the threatener, and why the attack is proportionate. If we found such unusual warnings in the chatter of lions, baboons, or caterpillars, we would be mystified by their evolutionary function, and so it is with human laws.

Finally, more evidence that laws are not threats comes from the lives of foragers. In foraging societies, the weaker members, not the superiors, commonly make and enforce the laws (see Notes). Foragers use laws against dominant aggressors to suppress their ambitions for power. The strong compel the weak by threats, while the weak compel the strong by laws.

Thus, we would be misled if we considered only the history of written laws. Writing was invented in agricultural societies with extreme hierarchies of power. Agriculture, wealth, and weapons enabled leaders to dominate society more than ever before. Written laws were issued by superiors simply because these societies were so dominated by superiors. They used statutes and courts as threats to dominate their societies. Hence, laws were confounded with extreme hierarchy from the beginning of written history. Accordingly, written laws began as a mixture of laws and threats, including hybrids and threats disguised as laws to make them appear more just.

This historical confound has caused much confusion, such as the classic dilemma about whether a king or god at the top of the hierarchy must follow the laws too. A threatener is not bound to obey their own threat, yet we sense that laws bind everyone. We resolve the confusion once we expand our view to include the foraging societies that comprise 99% of human history. Among foragers, a few superiors do not use laws to compel the many, but rather the many use laws to compel the few. Laws are made and enforced by everyone in the community not only the superiors at the top. So yes, kings and gods must follow laws too.

3.2. Laws are moral rules

Upon close examination, we had to conclude that laws are not threats because they have different parts and uses. But the comparison to threats sharpened our picture of the anatomy of laws, and we now notice a striking resemblance to a special adaptation of the human mind—moral rules.

Across societies, moral rules forbid actions like murder, theft, adultery, sorcery, eating taboo meat, and so on. Moral rules also compel actions like sharing food, performing rituals, and fighting the group's enemies. Like laws, moral rules apply to everyone, they set a condition that is a specific action and requires evidence, they concern an infinite variety of actions, they are enforced by everyone with blame and punishment, and the punishment is proportionate. Moral rules match laws part for part.

To fully appreciate the parallels, we again need to distinguish genuine laws from fake laws that are really threats in disguise. As we

have seen, threats, whether spoken or written in statutes, have parts that differ from laws, so we can distinguish threats in disguise from genuine laws. Recall too that threats are easy to understand: a king who writes a statute to punish dissenters uses the same strategy as an alpha baboon who charges at rivals. In contrast, we seek to understand the strange parts of laws, including their use of actions, truth, impartiality, and proportion. A precious clue is that moral rules share the very same peculiarities.

Indeed, the match is too remarkable to be a coincidence. More likely, laws and moral rules are one and the same. Hence, we can understand laws and their strange parts by understanding the evolutionary purpose of moral rules.

Moral rules come from the human faculty of moral judgment. Moral judgment works like a complex organization with divisions that specialize in different tasks. Four major divisions enable us to: (1) judge a person's action according to moral rules, (2) learn the rules held by other people, (3) invent new rules, and (4) debate the rules with people in the community.

First, and most direct, we morally judge people's actions after we see, hear, or imagine what they did. Moral judgment takes the person's action as input and computes its magnitude of wrongness as output, which we experience as a graded feeling from slight offense to extreme outrage. When computing wrongness, the mind compares the action to the list of moral rules stored in memory, which we continuously update according to discussion, debate, and precedents in the community. We also assess the evidence that the person is guilty. Then we announce our judgment to other people, argue over guilt and wrongness, and blame and punish the offender according to the severity of the offense.

The second division of moral judgment enables us to learn moral rules. We learn the rules held by other people and the differences in rules between situations and groups. Particularly, children need to learn the rules in force because communities have different moral codes. Thus, children eagerly learn moral rules just as they learn their native language. And like language, children learn morals so readily because they know what to look for. Their moral cognition provides an initial set of common rules, a template with the form of rules, and topics that usually have rules such as violence, property, food, sex, and power. Guided by this moral sense, children quickly recognize and remember moral taboos and obligations, similar to how they use mental templates to learn about animals and tools. Children do not, of course, necessarily follow the rules they learn. The learning faculty aims to assemble accurate records of the rules enforced by the community, which the child needs to know whether they follow or evade them. Beyond childhood, we continue to learn new rules as people invent and amend them.

The third division specializes in inventing moral rules. By this mental power, we recognize when we need a rule, such as when a current rule harms us or we encounter a new type of conflict. Then we invent a rule by using the template, such as looking for actions we could forbid or require. Then we mentally simulate the effects of the rule, such as checking whether it would benefit us and whether others are likely to support it. We may also discuss the rule with others and repeat these steps until we design a suitable rule. Finally, we propose the rule to the community.

The fourth division enables us to debate moral rules. The community debates the rules to establish which ones are in force, according to the majority who enforce them. To form an opinion, we need the ability to judge a rule itself. That is, rather than judging a person's action, we ascend to a higher level to judge the rule of action, a kind of metacognition. We judge a rule according to the template for rules, core principles such as truth and impartiality, and related rules and precedents. To debate intelligently, we need to assess whether the rule benefits us, our kin, and our allies, so that we can support rules that benefit us and oppose rules that harm us. We also assess whether others are likely to support the rule according to their interests, which tempers our partiality to build consensus.

Once we choose our stance on the rule, we compose arguments to

persuade others. For instance, we commonly argue that the rule benefits everyone and aligns with other rules and precedents, or we argue that it harms everyone and contradicts other rules. Our moral judgment often prepares these arguments quickly and automatically, complete with examples, precedents, and analogies. The argument can appear in our mind so suddenly that we seem to directly perceive what is right and wrong, as surely as we see a tree in front of us. So we may be surprised and disturbed when other people disagree, because their minds prepared arguments to justify the opposite conclusion. We further improve our arguments by rehearsing them against imagined opponents and by testing them in debates. Altogether, moral judgment helps a person argue for the rules that benefit them.

In sum, laws are moral rules and they both come from moral judgment, a complex adaptation in the human mind with divisions that apply, learn, invent, and debate moral rules.

3.3. Moral rules are not for cooperation

We have briefly summarized the major divisions and operations of moral judgment. Why then did humans evolve such elaborate powers of the mind devoted to moral rules? What is all this rulemaking for?

One common opinion is that moral rules are for cooperation. That is, we make and enforce a moral code in order to cooperate more effectively with other people. Indeed, traditional theories beginning with Darwin assume that morality is the same as cooperation. These theories successfully explain many forms of cooperation, such as why humans and other animals care for offspring, trade favors, respect property, communicate honestly, and work together in groups. For instance, theories of reciprocity explain why humans keep records of other people's deeds in the form of reputation, why we seek partners who are nice, kind, and generous, why we praise these virtues, and why we aspire to attain them.

However, if we look closely, these theories explain cooperation, not moral judgment. Cooperation pertains to our decisions to benefit or harm someone, whereas moral judgment pertains to our judgments of someone's action as right or wrong. The difference is crucial because these mental faculties operate independently and they evolved separately. For instance, people can use moral judgment to cooperate but also to cheat, such as a thief who hides the theft because they judge it to be wrong, or a corrupt leader who invents a moral rule that forbids criticism of the leader. Likewise, people use moral judgment to benefit others but also to harm them, such as falsely accusing an enemy of murder to imprison them.

Regarding their evolutionary history, moral judgment is a recent adaptation while cooperation is ancient and widespread, some forms as old as the origins of life and multicellular organisms. Recalling our previous examples, social animals like gorillas, baboons, lions, and hyenas cooperate in numerous ways. They care for offspring, share food, respect property, work together in teams, form reputations, and judge others' characters as nice or nasty. But these species do not communicate rules of action, nor do they learn, invent, and debate the rules. Like language, moral judgment most likely evolved recently in the human lineage, long after complex forms of cooperation.

More generally, to understand moral judgment, we need a steady hand and a scalpel to carefully separate its parts and operations from its neighbors, associates, and mimics in the mind, including threats, dominance, cooperation, character, and reputation. We cannot follow those who loosely attach the word *moral* to anything vaguely social and vaguely good. This is like trying to dissect the heart with a blender. We only lose sight of morality in a mush of social goodness. Especially, take care to distinguish moral rules of action from the actions themselves. Morality is *about* actions such as cooperation, honesty, and monogamy, but it is not the same as those actions, just as a song *about* a tree is not the same as a tree. Another hazard is to take good actions and jump to the conclusion that they were compelled by moral judgment. For example, cooperation and honesty can be caused by different motives including

altruism, prudence, and reputation, in addition to moral judgment. Consider that ants and bees cooperate impressively but they do not communicate or debate moral rules. Humans too usually cooperate without the aid of moral judgment, motivated by benevolent faculties that evolved long before morality.

Thus, theories of cooperation cannot help us understand moral rules because they overlook their parts rather than explain them. As we have seen, particularly puzzling is the prominence of actions, which generates endless rules and diverse moral codes across cultures. The prominence of actions gives moral judgment the rigid character of taboos. In hundreds of experiments on moral dilemmas, participants judge that an action is wrong even when it would do more good than harm, and thus would be more cooperative and compassionate. For instance, many people judge that it is wrong to sacrifice one person to save five people, to steal medicine to save someone's life, and to lie to console a person in distress. In these cases and many more, people judge the action to be wrong even though it would do more good. Further, many moral rules inflict great harm, such as taboos against homosexuality, contraception, abortion, witchcraft, science, and medicine.

In contrast, like other judgments outside of morality, human cooperation is not fixated on actions but focuses on consequences, doing the most good. Cooperation operates by a few principles including kinship, reciprocity, and mutualism, rather than an endless catalogue of rules that forbid and require particular actions. And the principles of cooperation do not need to be announced and agreed upon, similar to cooperation in other species such as ants and hyenas. Our cooperative judgments weigh the consequences as better or worse, rather than categorize an action as right or wrong. As a result, our cooperative motives often conflict with moral motives, creating dilemmas such as whether to steal to benefit others. Cooperation does not require evidence that someone deserves help nor does it require impartiality. In fact, cooperation often prescribes the opposite: unconditional kindness and partiality for family and friends. And cooperation is compelled by rewards such as reciprocity and reputation as much as by punishment.

Cooperation explains much of human society but we need to look elsewhere for the function of moral rules.

3.4. Moral rules are for choosing sides

To find the purpose of an adaptation as exotic as moral rules, we might ask what else is unusual about the human species. As the great detective Dupin once observed, "It is by these deviations from the plane of the ordinary, that reason feels its way, if at all, in its search for the true."

Return to the matter of fighting and consider the peculiar ways that humans fight. Like other animals, humans threaten opponents, they signal dominance and submission, and they form and remember dominance relations and hierarchies. This much is ordinary. But recall that humans also suppress hierarchy by joining together against aggressors who seek to dominate society. The result is striking. Unlike gorillas, baboons, and hyenas, humans in most foraging societies have no alphas and no leaders. Foragers still seek dominance but they also suppress it well enough that no single person can dominate the group. This is most extraordinary.

So how do foragers prevent a leviathan from ruling them all? The trick is that the weak team up against the strong. Humans are coalition specialists, experts at forming teams to win conflicts. It may seem easy to us but while many animal species have hierarchies, relatively few form coalitions. And among those with coalitions, most ally with kin such as female baboons who compete in coalitions of matrilineal kin. In a few species, unrelated fighters form coalitions but generally to defend rather than challenge the hierarchy, like hyenas who join fights to support the dominant fighter. As our closest relative, chimpanzees form more flexible coalitions that sometimes challenge dominants. But humans stand out for our ability to form complex coalitions of numerous fighters in different combinations. The scarcity in other species shows that complex

coalitions are difficult to achieve both cognitively and strategically. The human mind contains specialized adaptations for teaming up against opponents, and this explains how foragers restrain an aggressor.

Humans band together to suppress dominants but teamwork creates new problems. A small coalition can defeat the alpha and then dominate society similar to a single fighter. Then its challengers, being coalition experts too, form a rival coalition. Inevitably, coalitions combine into coalitions of coalitions, and the pacts continue until everyone is enmeshed in a tangled nest of alliances. Moreover, for conflicts inside their coalition, fighters also ally with outsiders from other factions. In other words, coalitions spur an arms race in which fighters entangle themselves with more allies to defend against opponents with more allies. Like an ordinary arms race, the result is that no one is secure because everyone else has allies too, but everyone carries the burden of many allegiances, which obligate them to fight in others' battles.

As a result, human conflicts can quickly expand as allies join each side. What would have been a fistfight between two people becomes a chaotic brawl among dozens, multiplying the injuries to everyone. Ethnographers have documented how foragers regularly suffer from these exploding conflicts leading to high rates of violence and murder. Coalitions can stop a tyrant but they also trample each other.

Surrounded by alliances, people need to choose sides carefully when a fight breaks out. One strategy is to return to hierarchy and support the fighter with greater status. If most people follow the hierarchy, then they can usually settle the conflict with a convincing threat that persuades the subordinate fighter to back down, while preserving the peace among coalitions. But enforcing the hierarchy strengthens the dominants and increases the danger they pose to everyone else.

A second strategy is to support the better ally, the one who supports you in conflicts more reliably. When most people support their own allies, dominants are weakened by opposing alliances, but everyone risks a fallout between coalitions. The original fighters each recruit their own allies which tend to be similar in number. The sides are balanced because in the race for allies, each person must trade loyalty for loyalty, where loyalty to one person requires deserting another. Since each person has limited loyalty to trade, they each end up with a stock of loyal allies. With the sides balanced, any fight could suddenly escalate to a deadly collision between coalitions.

Caught between the mischiefs of tyrants and factions, a third strategy evolved for choosing sides—moral judgment. The observer morally judges the actions taken by each fighter in the conflict, and then they side against the fighter whose actions were the most wrong. To judge the fighters' actions, the observer compares them to the moral rules that the community has established by discussion, argument, and precedent, which they previously learned and recorded in memory. Applying this code of laws, moral judgment computes a magnitude of wrongness for each action to determine which fighter committed the action that is the most wrong.

When most people choose sides by moral judgment, provided they share the same rules and evidence, they will choose the same side. Condemners amass in outrage against a thief, a murderer, a fornicator, or a heretic. As a menacing crowd, the condemners usually settle the conflict by a convincing threat, persuading the wrongdoer to accept their judgment and punishment. United by moral outrage at an action rather than loyalty to factions, the observers avert the danger of a clash between alliances that could otherwise entangle them. And the majority coordinate their choices without following the hierarchy, keeping dominants in check. By the moral strategy, the observers dodge the dangers of tyrants and factions because they choose sides according to the fighters' actions instead of who they are, their ranks and alliances.

Thus, natural selection favored moral judgment as a strategy for choosing sides in conflicts. Importantly, humans did not replace hierarchy and alliances but rather added moral judgment as a third tactic to consider according to its advantages in a given conflict. The three strategies are different equilibria in a coordination game where the observers of a fight try to avoid colliding with each other. So the best

strategy depends on how other observers choose sides, and communities vary in which strategy becomes customary for different kinds of conflicts.

The problem of choosing sides explains why humans have moral rules with their strange parts. Amid conflict and hierarchy, complex coalitions add new dangers to the trials of natural selection. Humans who choose sides by moral rules sometimes escape the snares of tyrants and the mines of factions. The rules focus on actions so that observers can coordinate on the same side, surrendering their allies without resorting to hierarchy. For the same reason, the rules are impartial, serving to detach the choice of sides from the fighters' ranks and allies. The crime must be demonstrated with evidence to assure the offender's allies of their guilt. Moral rules are backed by punishment because they are built for joining attacks against an opponent, not for cooperating or doing the most good. The punishment is proportionate, neither too lenient for allies nor too harsh for enemies, so it can be agreed upon by the rival coalitions behind each side.

Moreover, humans invent endless rules because they have endless conflicts. For the moral strategy to work, the catalogue of wrongs needs to cover enough actions that at least one wrongful action will occur in any given fight. When new types of conflict arise, people need new rules to cover them, so our moral cognition searches for new actions to add to the code.

3.5. Laws are for choosing sides

Because laws come from moral judgment, they have the same evolutionary function. Humans make so many laws so that we can choose sides in conflicts by rules of action instead of hierarchy or faction. Natural selection equipped the human mind to make laws as part of a strategy to protect ourselves in a treacherous world of alliances.

Among foragers, morality and law are one and the same. With the invention of writing, leaders elevated moral rules by inscribing them in public records as official laws. Laws are proclaimed in ritual and ceremony, exalted in mythology, and enforced by the power of government—all making the ratified rules more prominent. Prominence adds force to a rule because choosing sides is a game of coordination where the players need to guess what other players will decide in order to join the larger coalition. Moreover, because there are numerous rules, both opponents in a conflict commonly break multiple rules, so observers must judge which offense was the most wrong and which rule supersedes another. When in doubt, the most prominent rule is the best guess because it is the most visible to others in the guessing game of coordination.

These rules, amplified by writing, ritual, and government, we call *the law*. The official laws include only a fraction of the moral rules in a community, those that officials have found practical and expedient to enforce. This fact gives the common impression that morality and law are different. Indeed, to be precise, written laws are a subset of moral rules that have been selected, refined, and elevated to serve the ends of lawmakers. Nonetheless, law and morality come from the same origin in the mind, because moral judgment produces the stock of rules from which official laws are chosen. Moreover, citizens use their moral judgment to assess the official laws and to coordinate attacks against the government when its laws stray too far from the community's moral code. Thus both the origin and stability of official laws depend on the natural laws composed by our moral judgment, backed by the coordinated attacks they unleash.

The game of choosing sides explains why written laws are so powerful, in fact more powerful than the leaders and officials who enforce them. For a prominent law can summon not only police and soldiers but also immense battalions of civilians who choose sides by following the law's beacon. The game of coordination explains too why the official laws can be suddenly overrun by rebels. Public events may change the most prominent strategy to a rule that turns citizens against the government. For instance, everyone could see a scandal of political

corruption and condemn it together, which then makes the prohibition against corruption more prominent than the obligation to obey the authorities, spurring a violent rebellion widely perceived as morally justified. By a synchrony of moral outrage, people perceive that the natural law against corruption supersedes the official law against violent revolt. Likewise, a public spectacle could make hierarchy or faction the most prominent strategy for taking sides, overriding law and morality altogether. For example, a dictator who prominently executes dissenters could make many citizens conclude that hierarchy supersedes moral judgment in that society.

The problem of choosing sides explains the ideas that laws are made of, as we previously saw for moral rules in general. Laws address an indefinite person *whosoever* because they could apply to anyone. The indefinite *whosoever* detaches the choice of sides from who the opponents are, their ranks and alliances.

Laws contain specific actions such as murder, theft, and blasphemy so that observers can use the actions as public signals to coordinate their choices in a conflict. The action serves as the condition in a conditional strategy to oppose and attack a fighter if they perform the forbidden action. The condition coincides with the possibilities of attack, which are often expressed by modal verbs such as *can*, *must*, and *shall* combined with an action, as in *shall not steal*, which means that stealing is not possible without blame and punishment. The same possibilities can be described with synonymous expressions, such as appending an adjective like *forbidden*, *wrong*, *permissible*, or *obligatory* to an action, as in *adultery is forbidden* and *stealing is wrong*.

Several elements of laws aim to appease the rival alliances on both sides, especially the allies of the offender. Laws require guilt, evidence, and truth in order to persuade the offender's allies to back down. Laws warn that everyone plans to attack the offender, both enemies and friends, because they aim to unify rival factions. And laws set proportionate punishments so that friends and enemies can agree on a resolution.

Finally, the content of laws follows the subjects of conflict. As we mentioned, humans make endless laws in order to cover endless conflicts. The themes of laws follow the subjects of conflict including violence, property, sex, faction, and power.

4. The battle to control the laws

The evolution of laws is not the end of the game but only the beginning. Once humans can compose laws to settle conflicts, the next problem is that they can make too many. Anyone can propose law after law. The laws can declare any action to be forbidden, permissible, or obligatory. Different laws can contradict each other and favor opposite sides in a conflict. As prolific lawmakers, humans can easily produce a multiplicity of laws too numerous to remember and too discordant to apply.

Hence, the ability to invent laws requires a corresponding ability to judge and debate which laws to accept into the community's code and which to reject. As we previously discussed, for this purpose, moral judgment assesses a new object: not a person's action but a law of action itself. The mind judges a law by comparing it to a mental template containing the main elements of a law including an action, impartiality, evidence, and proportion. We assess whether the law is consistent with current laws or contradicts them, since contradictory laws are no better than none for resolving a conflict. Critically, we assess the consequences of the law especially for ourselves and our allies by imagining its effects. Finally, we consider how many people support and oppose the law to weigh what influence we could have.

The code of laws in a community is the current result of these negotiations. When everyone agrees on a law, it is stable and universal. Generally, everyone supports laws against murder, theft, and lying because everyone could be murdered, robbed, and deceived. As each person simulates the effects, they conclude that protection against murder is more valuable than the freedom to murder.

But when many people disagree on a law, it is unstable and varies over time and across societies. For example, people may disagree on a law that forbids consuming alcohol. Simulating the effects, some people conclude that they would lose little from abstinence but would benefit by blocking others like their spouse and children from alcohol and its associated troubles. Other people conclude that they would lose more than they gain from the prohibition.

Locked in disagreement, the opponents struggle in a tug of war to control the law. The opponent who persuades the most supporters wins the contest and determines the law in force. For instance, if the prohibitionist sways the majority, then the majority will side against a drinker in a conflict over drinking, such as a quarrel between a mother and her daughter who drinks. The dissenters lack the support needed to resist. But victory is temporary. If the dissenters later sway the majority, then they will repeal the law, and so on back and forth for as long as powerful groups disagree.

Since humans invent endless laws, disagreement is constant. People propose laws that benefit themselves, which sometimes benefit everyone but more likely hinder at least some members. Let us not be misled by the stable and universal laws whose unanimity and permanence we justly admire. What is universal too is disagreement.

Thus begins the battle to control the laws. Let us examine some common skirmishes from the major battlefields.

4.1. Laws of violence

Thou shalt not kill. Thus proclaims the most unanimous and iconic of moral laws. Anyone who is mortal supports it. If only all laws were so agreeable.

In general, violence is the subject of numerous laws in every society because it is the peak of conflict. Recall that humans forbid actions that are common in conflicts, so that the action can signal which side to oppose. What actions are more common in vicious fights than strikes, stabs, shots, and murder. And everyone supports laws against these actions because they lose more by being stabbed than they gain by stabbing.

But there are of course exceptions, which leaves plenty to debate. Depending on the society, a person may kill someone to punish a wrongdoer, to defend their life, and to protect their country in war. Indeed, just a few lines after "thou shalt not kill," the laws from Exodus sentence to death whosoever "curseth his father, or his mother," "lieth with a beast," and "sacrificeth unto any god, save unto the Lord only" (Table 2). Generally, before societies were wealthy enough to afford enormous prisons, death was one of few penalties available for serious crimes. People may support the death penalty when they fear murderers and robbers more than they fear the executioner, including their chance of death by a false conviction. As governments could afford prisons, people's calculus turned against the death penalty since they could lock up murderers without the risk of killing the innocent. The laws changed by disagreement and debate. Opponents grew in number and steadily eliminated the death penalty for all but a few offenses where the debate continues.

Self-defense is another justification under constant debate. People disagree on how evident the threat to life must be to allow a person to kill someone. In recent years, lawmakers in some U.S. states have removed the duty to retreat so a person can kill an aggressor even if the person could have fled, a new law that other people strongly oppose. Self-defense also animates the issue of guns and other weapons designed to kill people: which weapons are permissible, who can possess them, and how and where they can be carried. As usual, people disagree because they judge the laws differently, especially the consequences for themselves. People who are able and willing to shoot an attacker may want the right to defense more than they fear the chance of being shot in defense, whereas people without a gun do not benefit from the right to use one.

Among nations, the matter of self-defense determines when people

judge that war is permissible. And given that war has commenced, people debate which weapons and tactics can be used to kill the enemy, such as debates over chemical weapons and drone attacks that kill civilians inadvertently. People also debate whether enemies can be tortured to gain intelligence for defense.

These debates over violence are not odd conundrums at the margins of morality. Neither do they come only from the distortion and decay of morality, as proponents will predictably claim of the opposing view. Disagreement is the inevitable consequence of our moral nature. Humans evolved the creative power to compose endless laws of action, which we must then limit and reconcile by debate. We judge laws partly by a universal standard but also by our divergent interests. Debates are unavoidable though we can endeavor to conduct them by rules of civility. All the more reason to support laws against violence.

4.2. Laws of property

Thou shalt not steal. The archetypal law of property forbids another action that commonly occurs in conflicts: theft. Humans are gatherers and crafters whose lives depend on possessing things like food, tools, and shelter. When supplies run short, someone else's stash probably contains precisely what a human needs. Time and again, an intruder grabs for the goods and the possessor defends them. Allies are alerted and they assemble behind each opponent, portending an explosive fallout. But the group can defuse the standoff if they have agreed that stealing is wrong. The allies on both sides can oppose the thief, return the goods, and keep the peace between alliances.

The law against stealing is nearly as popular as the one against killing. Slightly different, everyone has one life to lose, but not everyone has many goods to be stolen. A commoner like Robin Hood who eyes a prince with mounds of gold may not feel so sure that stealing is wrong, at least until another woodsman swipes his bow. But generally, most people oppose theft because they lose more by being robbed than they gain by robbing. Secure possessions that can be rationed and improved are worth more than fleeting loot that will soon be looted.

However, there are again complications, exceptions, and endless debates to fill the law books. Take another popular rule which is exactly the opposite of banning theft: *Thou shalt share*. To see how they are opposites, consider an intruder who grabs food from a possessor's bag. If the most prominent law requires the possessor to share, then everyone now opposes the possessor. Thus, the two rules favor opposite sides. They conflict and need to be reconciled by determining which applies in what situations, if they are to settle disputes.

The rivalry is illustrated by a common custom among foragers. In many societies, hunters are obligated to share meat with the group but gatherers can keep plant foods for themselves. Hence, the law is *thou shalt share* for meat and *thou shalt not steal* for plants. Everyone knows the difference. Indeed, everyone knows the precise formula for sharing, which dictates who gets which cut of meat down to the last bit. Anthropologists explain the difference: The yields from hunting are sporadic and large while those from gathering are steady and small. Consider then how people will judge the rival laws in each case. People conclude that they gain more by receiving meat on many unlucky days than they lose by sharing meat on lucky days, especially since a big animal is too much to eat. But for gathering, it is better to keep the plants you collect than to receive a share from others.

Though most foragers agree, not everyone does. A prolific hunter may conclude that they bring in much more meat than they receive, so they favor the rule that forbids stealing over the one that requires sharing. This disagreement happens often enough that foragers developed elaborate strategies to suppress the talented hunters who challenge the custom. Instead of expressing gratitude for a meal, foragers criticize, diminish, and ridicule successful hunters. If a hunter dares to take credit, the group uses gossip, shaming, and exclusion to humble them. Foragers even hold supernatural beliefs that deny a hunter's talent. For instance, some foragers believe that the animal chooses to let the hunter kill them,

so the hunter's skill makes no difference. These concerted efforts show that foragers maintain the obligation to share by constantly debating the rebels who challenge it.

Debate also explains how the laws of property can suddenly change. For example, as markets expanded, people from small-scale societies began to trade in the market and save money. By saving money, someone can insure themselves against hard times so they are less dependent on sharing. Moreover, people who save money are more burdened by obligations to share, since others can take their earnings which reduces the benefits of work. So with trade and money, many people conclude that they gain more from the ban against theft than the obligation to share, and with enough supporters they can change the customary rule accordingly. For example, anthropologists documented how markets led people in various societies to abandon the custom of blood covenants, which obligated people to share with a blood brother.

Finally, the same battle continues in modern debates over the size of government. Taxes and public benefits are forms of *thou shalt share*. Predictably, opponents argue that taxes are theft, favoring *thou shalt not steal*. Historically, the rule against theft prevailed until the twentieth century when taxes and public benefits skyrocketed in country after country. One contributor was that wealth increased exponentially in the twentieth century making many people more secure and willing to share. Another was the immense public spending in World War II which accustomed citizens to higher taxes. In the end, many people, especially those who earn less income and pay less in taxes, support considerable government spending including on retirement benefits, health care, food, and housing. Despite the dramatic rise in social spending, and accompanying gains in health and prosperity, the skirmishes over taxes and sharing continue on the front lines of politics.

4.3. Laws of sex

Thou shalt not commit adultery. The biblical prohibition against adultery exemplifies the many laws that govern sexual behavior. Like most animals, humans constantly fight over sex. When these fights divide the community, the group can settle the dispute if they have established laws against sexual actions that commonly occur in conflicts. Depending on the society, the community may side against a person for adultery, premarital sex, nudity, sexual harassment, homosexuality, prostitution, and other sexual taboos. Unlike the basic laws of violence which are relatively stable, the laws of sex are unstable and forever locked in bitter disagreement.

Generally, humans and other animals fight over sex because mates are a limited resource for reproduction and parental care. Thus animals fight to attract, control, and guard mates against competitors. In humans, the emotion of jealousy motivates people to watch their mate for signs of infidelity, to attack intruders with insults and violence, and to deter a mate from straying with threats of punishment and abandonment. The combination of sex and jealousy is a recipe for deadly conflict. In every community, there are pursuers driven by powerful motives to seek mates, including mates bound to others if necessary, and then there are possessors who stand guard with guns of jealousy ready to fire at the first wrong move.

Standoffs among lovers menace society by risking war between factions, unless the community has laws of sex to unite them in conflicts. The simplest and severest law is to ban all sexual behavior completely, except for sex that has been officially approved by the community. Indeed, marriage can be understood as an official license to mate and reproduce, granted by the community. The married couple may have sex, must not have sex with others, and must care for their children. With the law of marriage in place, the community can unite in conflicts to oppose whosoever has sex with others or neglects their children.

In the strictest forms, the laws ban all other sexual behavior. As a danger to society, all sex is condemned as immoral and punishable, unless it is officially licensed for the limited purpose of reproduction by a married man and woman. The broad prohibition makes it unnecessary to

state and justify every action that is banned. Anything of a sexual nature is wrong by default, covered by the broad category of sex without a license. So the strict laws forbid not only adultery, which directly violates marriage, but also premarital sex, homosexuality, polyamory, prostitution, masturbation, even pleasure in marital sex—all prohibited by default as unlicensed perversities. Merely thinking about sex, and causing others to think about it, is wrong. So puritans condemn obscenities like immodest dress and nudity along with sexual language, jokes, images, stories, films, science, and art.

In a given society, the majority may favor strict laws of sex because each person gains more by blocking their partner from unlicensed sex than they lose by restricting themselves from it. Even so, many people will inevitably see the issue differently. Not everyone has a mate to guard or plans to guard one. The pursuer of a married spouse may feel that some affairs are acceptable, particularly when the spouse is unhappy in their marriage. A young adult or free spirit may seek intimacy with several partners rather than a secure mate for parenting. These and other dissenters gain little and lose much when society broadly prohibits sex.

The dissenters favor a rival law for sexual freedom, the opposite of restrictions but equally sufficient for settling disputes. In their view, what is dangerous is not sex itself, which is mutually pleasurable, but the violent attacks that follow from jealous competitors and malicious puritans. So they instead support a ban against sexual jealousy and prejudice: *thou shalt not attack someone for sex*. Under this rule, when people fight over sex, the community now sides against the person who shamed and punished someone for consensual sex, rather than the one who engaged in premarital sex, homosexuality, obscenity, and so on.

In a given society, the current laws of sex are the unstable result of a ceaseless battle. One coalition wants laws that punish sex outside of marriage, while the opposing coalition wants laws that protect sexual freedom by punishing jealous aggressors. When circumstances change, one coalition may gain support and make the laws more restrictive or permissive. For instance, the invention of better contraceptives changes each person's calculations of the risks of pregnancy, which shifts support toward permissive laws. Moreover, a society often has an incoherent mix of strict and permissive laws, as rivals win sporadic victories on different fronts.

The battle over the laws of sex is perpetual, for reasons that are not widely appreciated. The root of the conflict is that humans have different mating strategies, ranging from monogamy to promiscuity. Many people use both strategies depending on the circumstances, but most at a given time lean more monogamous or more promiscuous. These groups fundamentally disagree: monogamous people want more laws of sex and promiscuous people want less.

Generally, many animals have different mating strategies including monogamy and promiscuity. The monogamous strategy is to mate with one partner and then guard them from others. The promiscuous strategy is to mate with a partner and then move on to the next partner. Humans have both strategies because each has different evolutionary advantages. For instance, monogamy is better for cooperative parenting, while promiscuity adds genetic diversity across offspring. Promiscuity also repurposes sexual pleasure to strengthen relationships, as illustrated by our close relatives, the promiscuous bonobos, whose sexual behaviors extend far beyond reproduction.

Humans did not invent monogamy or promiscuity and neither strategy will fade away. Monogamy occurs in many animals, most abundantly in birds at 90% of species, but also in fish, frogs, rodents, and more. In mammals alone, monogamy evolved at least 60 times independently. Promiscuity is more common still, especially in mammals where roughly 90% of species are promiscuous and 10% monogamous. Moreover, many of the same genes, hormones, and brain structures regulate monogamy and promiscuity from fish to amphibians to mammals, and they have been conserved across species that diverged 450 million years ago. So again, 450 million years of evidence shows that humans did not invent monogamy or promiscuity, and they cannot

uninvent them.

Monogamy and promiscuity are abundant in all human societies, even though some societies suppress promiscuity with harsh punishments including execution. Beyond their plain frequency, the two strategies are written unmistakably into our human anatomy, physiology, and psychology. For example, in human males, the size of the testes, the volume of sperm, the motility of sperm, the viscosity of seminal fluid, and related features all show an evolutionary history of moderate promiscuity in humans compared to other primates and mammals. In human females, physiological features such as concealed ovulation and continuous receptivity to mating outside the fertile period, show an evolutionary history of promiscuity and the modification of sex for social purposes beyond reproduction.

As for psychology, in addition to jealousy for guarding mates, the emotion of disgust helps to regulate mating strategies. In the monogamous strategy, a person feels disgusted by sexual contact with everyone except their partner. In the promiscuous strategy, a person's disgust is inhibited and they instead feel sexually attracted to multiple people including strangers. The difference explains why a monogamous person feels that casual sex is dirty, filthy, polluted, and impure—metaphors that express disgust, while a promiscuous person does not feel disgusted because the emotion aligns with their mating strategy.

Having different mating strategies, humans in every society inevitably disagree about the laws of sex. Neither coalition can realistically hope to convert their opponents by preaching, indoctrination, and persecution, whether they preach for abstinence or sexual freedom. A more practical goal is to conduct the struggle peacefully by diplomacy, tolerance, and truce.

4.4. Laws of faction

The next field of battle contains the essence of law itself: impartiality among factions. A society that surrenders impartiality to factions has in the same measure surrendered law and morality. At stake in these disputes is whether the community will be governed by the rule of law or the rule of faction, where the strongest faction dominates rivals under the disguise of laws.

Humans are experts at teaming up to form factions so any dispute between two people could explode into a brawl between multitudes of opposing allies. For instance, if someone from the red clan stabs a member of the blue clan, the bloodshed could multiply if more reds and blues come to defend their ally and stab the opposing clan in retaliation. As we discussed, they can avoid this fate if everyone instead chooses sides according to a law against stabbing, aligning everyone against the initial stabber. However, a zealous partisan of the red clan might argue that true reds must always support reds in the long-standing struggle against the blues. The red partisan claims that the blues have stabbed reds for ages so they deserve it, and the laws are nothing but the corrupt tools of blue domination. Further, the red partisan might go on to take power and ban blues from public office, ban speech supporting blue ideas, and require citizens to publicly pledge their loyalty to redness. To the extent that the partisan succeeds, the society shifts from the rule of law to the rule of faction, in which people choose sides by factions instead of laws—while suffering the costs of divisive conflict. To prevent these disasters, people can agree to laws of faction, which aim to prevent any faction from enforcing loyalty to itself.

Thus, laws and factions are necessarily in opposition. The fundamental law of laws can be expressed as, *Thou shalt choose sides by laws, not factions*. However, in evolutionary games, every strategy spawns a counterstrategy. Humans did not just lay down their alliances once they had impartial laws. Quite the opposite, laws make each person less secure by neutralizing their allies, which intensifies the person's need for loyal allies who will support them, right or wrong. Once laws evolved in humans, natural selection favored those who could form stronger alliances that are resistant to impartial laws.

There is however a natural limit that prevents factions from

overcoming impartiality entirely: the violent clashes that prompted impartial laws to begin with. A virulent faction may defeat impartial opponents at first, but their success breeds further virulent factions that will eventually clash with each other. The more blood spilled between vicious alliances, the greater the mutual benefits of impartial laws, attracting supporters behind them. The limit is analogous to the natural limit on aggression in animals: natural selection does not consistently favor the most aggressive bears, wolves, and baboons because when common they destroy each other.

Law and faction, then, are eternal enemies in human societies. In general, people will support the rule of law when they gain more by keeping the peace between factions than they lose by surrendering allies who have broken the law. In contrast, people will abandon the rule of law when they gain more by supporting their faction than they lose by risking a fallout between factions. Often, the dissenters oppose many of their society's laws and intend to cross them, so they prefer reliable allies over laws against their interests.

As a faction gains loyalty and power, the laws inevitably get in the way since they require impartiality. To counter the rule of law, a faction proclaims the opposite rule of loyalty: members must side with each other in conflicts with outsiders, and members must not side with outsiders against us. Often, these proclamations of loyalty openly disregard law and morality. In addition, however, loyalty can be disguised as a law or moral rule, as in, *Thou shalt not betray our faction*.

The ploy takes advantage of the structure and flexibility of laws, particularly that humans can make laws for virtually any action, whether blasphemy, sorcery, dance, astronomy, and so on. To enforce loyalty to themselves, a faction can enact laws that require actions such as oaths of allegiance to the faction, and laws that forbid actions such as betrayal, treason, heresy, and subversion. The result has the form of a law even if its meaning is the antithesis of laws in general. For a law that forbids opposing a faction allows its members to win all conflicts regardless of the laws, which the faction can also rewrite without opposition. These laws contradict themselves, similar to the law, *Thou shalt not follow laws*, which has the standard form but obviously undermines every law including itself. We can call this species a paradoxical law, a law that undermines laws in general.

Hence, among the laws of faction, we have paradoxical laws that demand loyalty and defensive laws that aim to stop them. For example, an aggressive faction wants laws that forbid speaking and assembling against them, which opponents counter with laws for freedom of speech, assembly, and association. A faction wants laws that forbid rival religions and political beliefs, which opponents counter with laws for freedom of religion and belief. A faction wants to jail and execute dissenters without evidence or trial, which opponents counter with laws that require evidence, due process, and public trials by an impartial jury.

In general, many of the laws that underpin modern democracies are counterstrategies against the tactics of factions. In Federalist No. 10, James Madison famously argued that factions pose a constant threat to any democracy, because a faction that takes hold of a majority can vote for laws that oppress their opponents. He wrote, "a pure democracy... can admit of no cure for the mischiefs of faction," and "such democracies have in general been as short in their lives as they have been violent in their deaths." Further, he argued that factions cannot be eliminated without destroying liberty since alliances are "sown in the nature" of humanity. Instead, Madison and contemporaries favored laws that prevent one faction from dominating other factions, enabling factions to check each other. For instance, elected representatives and a large union of states would make it more difficult for an aggressive faction to take hold of a majority. Thus, Madison hoped, "factious leaders may kindle a flame within their particular States, but will be unable to spread a general conflagration through the other States."

4.5. Laws of power

Last, another site of conflict is the power to make decisions for

society. A society must make many collective decisions about matters such as war, crime, taxes, immigration, medicine, and poverty. Yet people commonly disagree about what society should do, so collective decisions are fraught with conflict. A community can resolve these disagreements if they have rules about who can make which decision and the procedure for reaching a decision. The laws of power govern who can, cannot, and must make collective decisions and which actions the deciders must perform to reach a conclusion.

Generally, four elemental rules for collective choice occur across human societies: authority, majority rule, consensus, and chance. Under authority, the leader who ranks highest in the hierarchy makes the decision unilaterally. Authority can also depend on a person's expertise and role in addition to general rank. Under majority rule, multiple people choose an option and the conclusion is the option with the most support. In addition to equal votes for everyone, majority rule is also used by select groups as in legislatures and the Supreme Court, and variations can require different thresholds such as a plurality or supermajority. Majority rule may also give some opinions greater weight, such as weighing the strengths of people's preferences, assigning people different numbers of votes, and permitting some members to veto the decision. Under consensus, multiple people decide and they must agree unanimously to reach a decision. Under chance, the decision is made by a random and impartial event such as a coin flip, a lottery, or a ritual of divination.

Moreover, humans combine the four elemental rules to form procedures of unlimited complexity, just as one can make unlimited melodies from four musical notes. Consider for instance the many steps combined when a society decides whether someone is guilty of murder: the detective's decisions to collect evidence, the forensic analyst's conclusions about blood and DNA, the prosecutor's decision to file charges, the judge's decisions about which evidence to allow, the jury's verdict by consensus, and so on. Laws govern each step and the combination of steps, and a mistake at any point can undermine the whole procedure to nullify a guilty verdict.

Each rule, and combination of rules, specifies a different procedure for collective choice. The methods are incompatible and the group can follow only one out of unlimited procedures. Hence, as with laws in general, humans readily create too many ways to make group decisions, adding a confusion of procedures on top of an original disagreement. And the procedures add another cause for conflict, especially because people judge a procedure partly by whether it is likely to satisfy their own goals which differ from other people's goals.

The community can resolve these conflicts if they have established laws of power for making collective decisions. The laws proclaim the procedures that must be followed to decide a particular issue, such as guilt for a crime, tax rates, or whether to declare war. When people fight over a collective decision, the community supports whoever followed the procedure required by law against the opponent who challenged the conclusion.

A society's rules for the most critical decisions characterize its form of government, including the range from absolute monarchy to democracy. Generally, people want more power for themselves so they favor majority rule over hierarchy for major decisions when possible. Recall, for instance, that foraging societies do not have one leader who rules the group. Instead, foragers make major decisions by a loose form of majority rule where multiple people debate the issue to determine the weight of opinion, though not by a precise count of votes. Whatever the general rule, however, societies also apply different rules for different types of decisions depending on their effectiveness and public support. For instance, an egalitarian society may still give a leader unilateral power for urgent decisions in war or to coordinate complex schedules of cooperation and production.

People disagree on laws of power as with other laws. Since the procedures for collective decisions are unlimited, so are the disagreements. Even the basic opposition between majority rule and authority is contentious. Among foragers, the dominants who strive for more power

disagree with the rules that restrict their ambitions, and the community must constantly suppress these dissenters to maintain an egalitarian society. In agricultural societies, when humans invented better farming and weapons, many dominant leaders gained the advantage and established absolute rule. In modern societies, people may support an aspiring dictator when they expect to gain more by backing the dictator than they lose by ceding power to them, for instance when the dictator promises to overthrow laws against the person's interests.

When a leader seeks absolute rule, they favor a kind of paradoxical law, similar to aggressive factions. Since laws can forbid or require any action, a leader can propose laws that require obedience and forbid disobedience, as in, *Thou shalt obey the leader*. Although they have the form of a law, laws for obedience are paradoxical. If people cannot oppose the leader, then they cannot choose sides by impartial laws, particularly when the leader breaks laws or supports a lawbreaker. Laws for obedience undermine laws in general. They return society to the rule of hierarchy, one of the dangers that laws evolved to escape, along with the danger of warring factions. And as with factions, people counter the paradoxical laws of power with defensive laws to stop them. These include laws that protect the political rights of citizens and those that subject leaders to the rule of law, restricting their authority to a limited and temporary office.

In sum, people compete to control the laws of power. Humans can form unlimited combinations from the elemental rules of authority, majority rule, consensus, and chance, so their disagreements are also unlimited. Especially prominent is the rivalry between paradoxical laws favored by aspiring dictators and the defensive laws for preserving the rule of law itself.

4.6. And many more

We could continue on to many more fields of battle. The subjects of law are unlimited, and they follow the subjects of conflict. Whatever humans fight about, they can make laws to govern the fights. And whatever actions commonly occur in fights, humans can make laws to forbid, permit, or require those actions.

Though unlimited, we have seen enough to find the common patterns. Human societies have stable laws, which most people support, and unstable laws, which people debate and battle to control. The laws of violence are among the most stable, since everyone could be punched and killed, while the laws of sex are among the most unstable, since people judge them according to different mating strategies which are fundamentally opposed. The unstable laws include paradoxical laws that undermine laws in general, especially laws for loyalty to a faction and obedience to a leader.

The same patterns repeat in different areas of law. Most common are the unstable laws that people disagree about according to their interests. The records of courts and legislatures describe a never-ending history of debate after debate in which opponents argue for laws that benefit themselves. These debates epitomize the nature of laws, as well as moral judgment. Humans can make too many laws, so they must debate to reduce the confusion of rules to a workable code. And with the laws at stake, humans evolved mental powers to argue for laws that benefit themselves, beginning the competition to control the laws.

5. Conclusion

We have come to the end of the trail. I hope you return to explore this wondrous territory further. Surely you will discover more marvels and conundrums to report. For your investigations, permit me a few words of reflection.

Remember we began with the question, What are laws? We dissected a statement of law, *Whosoever is guilty of murder...*, and we found a distinct structure and combination of ideas, including indefinite people, specific actions, intentions, truth, impartiality, possibility, necessity, punishment, and proportion. And the same ideas and structure

characterize laws in general, including laws from foraging societies, the Book of Exodus, the Code of Hammurabi, English law, the Constitution of the United States, and so on.

Well it is precisely this structure of ideas that we need to explain, though it is commonly overlooked. By analogy, to understand an unusual appendage on an orchid, we first dissect its parts and describe how they are organized, and then study how the parts work together to benefit the genes that make them. The same method applies to adaptations of the mind, such as the mental programs that allow bats to compute their surroundings by echoes, spiders to build intricate webs, and baboons to know the kin and allies of everyone in their troop. We cannot see an animal's mental powers as easily as the parts of anatomy, but we can observe the mind's operations by their effects, such as inferring that rats have mental maps from the classic demonstration that they choose the shortest route through a maze when the previous route is blocked.

Mental powers have parts too which we can conveniently call ideas. Ideas include the mental representations that store each piece of knowledge, and the rules the mind uses to make inferences and create new ideas. Ideas are also communicated in messages such as alarm calls, mating songs, threat displays, and the waggles of bees that communicate precise directions. Laws, as mental adaptations, fall under the category of messages, since laws must be spoken or written to others to serve a purpose. Hence, just as we would study a waggle dance or alarm call, we can understand laws by examining what ideas compose these messages and what function those ideas combine to perform.

Thus, we should focus resolutely on the structure of actual laws, and try not to be carried away by vague sentiments, abstractions, associations, and hopes about the law in general. For instance, someone may feel that laws are vaguely good for society and then set out to explain the evolution of social goodness with theories of cooperation. But this is like someone who sets out to explain the bee's waggle dance as generic cooperation, without noticing the different movements that encode direction and distance, or even that the waggle points to a distant location. In other words, they overlook the waggle completely and instead try to explain the social good they suppose it represents. The oversight is even worse for laws because many real laws harm society and most hinder at least some members.

Having anchored ourselves to concrete laws, we next asked, What are laws for? This is the central question for any mental power because it persists only by aiding an animal in evolutionary competition. In this search, we should not be deterred by the magnificent creativity and variety of laws. Some people suppose that natural selection could impart no more than a few fixed laws in the human mind, but there are no grounds for this supposition. Natural selection designed all life on Earth and its creativity exceeds our own. The mental adaptations of animals outperform our best computer programs on routine tasks such as locomotion and vision. Why suppose that human laws must be far simpler than, for instance, the flight controllers in the brain of a hummingbird? And there are obvious counterexamples. Language is a complex adaptation but this does not mean that humans speak just a few sentences. Tool use comes from mental adaptations including an intuitive theory of physics, and again these abilities do not limit but enable the enormous variety of tools.

To decipher the function, we attend to the parts of laws from our dissections. We can generalize the common structure as a conditional statement: *If anyone [action], then they will be punished* (Table 2). We saw that this form is similar to threats but with critical differences showing that laws are not ordinary threats. But laws do match the structure of moral rules indicating that they have the same origin and function: Laws are for choosing sides in conflicts. A person who speaks a law to a group is sending a message that calls for everyone to choose sides in conflicts according to that law, namely to oppose whoever performed the forbidden action, regardless of their status or faction. We saw how the strange parts of laws become intelligible by this purpose.

Perhaps the most telling clue is the variable [action]. By its power,

humans can propose infinite laws to govern nearly any action. The prominence of actions gives moral judgment the character of rigid taboos. The forbidden actions are not merely a rough guide to what is good and benevolent, but an absolute declaration of what action everyone will oppose and punish, whether it is harmful or beneficial. This is why humans condemn many actions that are harmless and good. Moreover, the rigidity differs strikingly from other human judgments, such as judgments of safety, altruism, and cooperation, which aim to maximize qualities such as health, happiness, and the greater good.

We saw how the variable [action] serves the purpose of choosing sides. Observers need a signal to coordinate on the same side in conflicts, and many actions can serve as signals. Further, humans use the variable [action] to create new laws for new conflicts. Creativity, however, necessarily causes confusion because humans make law after law, and the many laws inevitably contradict each other. To reduce the confusion, humans evolved a corresponding ability to debate which laws to accept. Humans argue for laws that benefit themselves, which leads to stable agreements but also to unstable disagreements, commencing the battle to control the laws.

Indeed, humans have powerful motives to control the laws, which we have only just begun to uncover. They are probably as strong as our motives for status and alliances. Humans build grand cathedrals and elaborate mythologies to bolster the laws they favor. And their opponents destroy the same monuments to defy them. So consumed in struggle, people may suspect any work of art or science to be an assault on the laws they revere. Particularly, the science of human evolution itself has long been accused of subverting the foundations of morality and society. The accusers charge that human evolution undermines the responsibility that laws require, and that human adaptations for murder, theft, promiscuity, and so on, erode the laws against them. In defense, it may help to point out that human evolution does not affirm a single code of laws but rather explains why humans make a great variety of laws and then fight to control them.

6. Notes

I have gathered here notes and selected readings on the arguments, facts, and examples from the main text. They follow the order in the text by section. We have taken a bird's eye view on an immense subject so I did not attempt to make the references comprehensive. However, these readings include thorough reviews of the numerous literatures we covered.

In writing this article, I applied the basic principles of clarity from style manuals, which Pinker (2014) refined according to the cognitive science of language. These principles include avoiding unnecessary jargon, particularly when standard English is more clear, concrete, and accurate. On applying the principles of clarity to write research articles, see DeScioli and Pinker (2022).

6.1. Notes on: what are laws?

See Pinker (2007) on the relations between words and ideas, the use of language to uncover elemental ideas, and some key ideas found in laws such as actions, intentions, and causality. Jackendoff (1999, 2009) examines the relations among cognition, modal verbs, obligations, and laws.

On the universal ideas underlying laws, see Robinson and Kurzban (2006) and Robinson, Kurzban, and Jones (2007). On the universal psychology of law, and for experiments showing that people readily comprehend and recreate the laws of distant cultures, particularly laws from ancient Sumer and medieval China, see Szyner and Patrick (2020).

6.2. Notes on: what are laws for?

See Dawkins (1976) on the evolution of threats, fighting,

conventions in fighting, and dominance hierarchies across animal species. See Schelling (1960) on the game theory of threats. For an analysis of the components of threats as speech acts, see Fraser (1998). See Maynard Smith and Harper (2003) on the evolution of animal communication in general. For research on threats, hierarchy, and alliances in baboons, hyenas, and other social animals, see Cheney and Seyfarth (2007), Holekamp, Sakai, and Lundrigan (2007), and de Waal (2016). Importantly, this research shows not only that these species form dominance hierarchies but also that they have a mental representation of the hierarchy, that is, the idea of a hierarchy. For reviews of research on foraging societies, including the roles of hierarchy, opposition to hierarchy, morality, and laws, see Boehm (1999, 2012).

See DeScioli and Kurzban (2009a, 2013) and DeScioli (2016) on the evolutionary functions of moral judgment, on the argument that moral judgment is not designed for cooperation, and on the theory that moral rules are for choosing sides in conflicts. For more on the rigid character of moral rules, which contradicts the theory that they are for cooperation, see Delton, DeScioli, and Ryan (2020), Del Ponte and DeScioli (2022), Kurzban, DeScioli, and Fein (2012), and Tetlock (2003). On moral psychology generally, see Haidt (2012) and Hauser (2006).

The argument that prominence reinforces both laws and moral rules stems from the game theory of coordination (Schelling, 1960). Prominence creates common knowledge of a law, which in game theory means that each player knows the other players know the law, they each know the other players know this, and so on. Common knowledge allows people to coordinate on the same choice. In this case, observers of a conflict aim to coordinate on which law to choose sides according to, so that they can take the same side. On the psychology of coordination and common knowledge in general and in moral judgment specifically, see Boyer (2018), De Freitas, Thomas, DeScioli, and Pinker (2019); DeScioli and Kurzban (2013), and Thomas, DeScioli, Haque, and Pinker (2014).

6.3. Notes on: the battle to control the laws

On the struggle to control moral rules and laws, see DeScioli and Kurzban (2013), Petersen (2015), and Weeden and Kurzban (2014).

On the psychology of property and ownership, see DeScioli and Wilson (2011), DeScioli and Karpoff (2015), DeScioli, Karpoff, and De Freitas (2017), and Stake (2004). Note that the human sense of property precedes laws about property, and it does not require laws though it can be altered by them. Unlike the complexities of morality and law, natural selection favors the convention of ownership in simple conflicts between two opponents, and it is found in different forms across a number of animal species (see Dawkins, 1976; Kokko, Lopez-Sepulcre, & Morrell, 2006; Maynard Smith, 1982).

On the rules about property and sharing in foraging societies, see Gurven (2004) and Wiessner (1996). On the different rules of property for plants and meat, see Kaplan and Hill (1985); Kaplan, Hill, Lancaster, and Hurtado (2000); and Kaplan, Schniter, Smith, and Wilson (2012). On the steep rise in wealth, taxes, social spending, health, and prosperity in the twentieth century, see Pinker (2018) and Our World in Data (<https://ourworldindata.org/>).

The laws of sex are perhaps the most widely misunderstood among social scientists. The main reason is that many commentators overlook or even deliberately ignore the psychology of human mating. Sexual taboos also hinder progress by censoring research and clouding the subject with euphemism and allusion. Another contributor is the misdirection of religion, by which people assume that supernatural beliefs are the main cause of sexual behaviors and opinions. The reality is the reverse: a person's sexual strategy draws them to or away from organized religions, which are essentially coalitions for monogamy and sexual restrictions.

On the relation between people's mating strategies and their opinions on laws and politics, see Weeden and Kurzban (2014). On the relation between religion and sexuality, for evidence that people's sexual behavior determines whether they attend church rather than vice

versa, and on the argument that organized religions are coalitions for monogamy, see Weeden and Kurzban (2013, 2014). On laws and customs of sex, marriage, and parenting as well as conflicts over the rules across cultures, see Boyer (2018), Boyer and Petersen (2013), and Low (2015).

On the evolutionary psychology of mating, mating strategies, and jealousy, see Buss (2000, 2016, 2019) and Gangestad and Simpson (2000). On the competition for mates in animals generally, see Dawkins (1976). On the evolution of monogamy in mammals, see Lukas and Clutton-Brock (2013). On the shared genes, gene expression, hormones, and brain regions that underlie monogamy across vertebrates spanning 450 million years of animal evolution, see Young et al. (2019).

On the human anatomy and physiology of mating strategies, including adaptations for sperm competition and concealed ovulation, see for reviews, Buss (2019) and Thornhill and Gangestad (2008), and for examples, Anderson and Dixon (2002) and Dorus, Evans, Wyckoff, Choi, and Lahn (2004). On the emotion of disgust in mating, morality, politics, and law, see Lieberman and Patrick (2018), Lieberman, Billingsley, and Patrick (2018), Tybur, Lieberman, Kurzban, and DeScioli (2013), and Tybur, Inbar, Güler, and Molho (2015).

On the psychology of alliances and factions, see Boyer (2018), DeScioli and Kurzban (2009b), DeScioli and Kimbrough (2019), and Shaw, DeScioli, Barakzai, and Kurzban (2017). On the psychology of collective decisions, power, and the use of authority, majority rule, consensus, and chance, see Boyer (2018), Bor, Mazepus, Bokemper, and DeScioli (2021), DeScioli and Bokemper (2019), and Fiske (1992). In addition, modern societies developed the innovation of markets, which sidestep the need for collective decisions about production, relying instead on the psychology of trade. Markets multiply production and wealth but as an evolutionary novelty they are prone to misconceptions such as confusing markets with hierarchies (see Boyer, 2018; Boyer & Petersen, 2018).

Declaration of Competing Interest

None.

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References

- Anderson, M. J., & Dixon, A. F. (2002). Motility and the midpiece in primates. *Nature*, 416(6880), 496.
- Boehm, C. (1999). *Hierarchy in the forest: The evolution of egalitarian behavior*. Cambridge, MA: Harvard University Press.
- Boehm, C. (2012). *Moral origins: The evolution of virtue, altruism, and shame*. New York: Basic Books.
- Bor, A., Mazepus, H., Bokemper, S. E., & DeScioli, P. (2021). When should the majority rule? Experimental evidence for Madisonian judgments in five cultures. *Journal of Experimental Political Science*, 8, 41–50.
- Boyer, P. (2018). *Minds make societies*. New Haven, CT: Yale University Press.
- Boyer, P., & Petersen, M. (2013). Studying institutions in the context of natural selection: Limits or opportunities? *Journal of Institutional Economics*, 9, 187–198.
- Boyer, P., & Petersen, M. B. (2018). Folk-economic beliefs: An evolutionary cognitive model. *Behavioral and Brain Sciences*, 41, E158.
- Buss, D. M. (2000). *The dangerous passion: Why jealousy is as necessary as love and sex*. New York: The Free Press.
- Buss, D. M. (2016). *The evolution of desire: Strategies of human mating* (Revised ed.). New York: Basic Books.
- Buss, D. M. (2019). *Evolutionary psychology: The new science of the mind* (6th ed.). Boston: Allyn & Bacon.
- Cheney, D. L., & Seyfarth, R. (2007). *Baboon metaphysics: The evolution of a social mind*. Chicago: University of Chicago Press.
- Dawkins, R. (1976). *The selfish gene*. Oxford: Oxford University Press.
- De Freitas, J., Thomas, K., DeScioli, P., & Pinker, S. (2019). Common knowledge, coordination, and strategic mentalizing in human social life. *Proceedings of the National Academy of Sciences*, 116, 13751–13758.

- Del Ponte, A., & DeScioli, P. (2022). *Pay your debts: Moral dilemmas of international debt*. 44 pp. 1657–1680. *Political Behavior*.
- Delton, A. W., DeScioli, P., & Ryan, T. J. (2020). Moral obstinacy in political negotiations. *Political Psychology*, 41, 3–20.
- DeScioli, P. (2016). The side-taking hypothesis for moral judgment. *Current Opinion in Psychology*, 7, 23–27.
- DeScioli, P., & Bokemper, S. E. (2019). Intuitive political theory: People's judgments about how groups should decide. *Political Psychology*, 40, 617–636.
- DeScioli, P., & Karpoff, R. (2015). People's judgments about classic property law cases. *Human Nature*, 26, 184–209.
- DeScioli, P., Karpoff, R., & De Freitas, J. (2017). Ownership dilemmas: The case of finders versus landowners. *Cognitive Science*, 41, 502–522.
- DeScioli, P., & Kimbrough, E. O. (2019). Alliance formation in a side-taking experiment. *Journal of Experimental Political Science*, 6, 53–70.
- DeScioli, P., & Kurzban, R. (2009a). Mysteries of morality. *Cognition*, 112, 281–299.
- DeScioli, P., & Kurzban, R. (2009b). The alliance hypothesis for human friendship. *PLoS One*, 4, Article e5802.
- DeScioli, P., & Kurzban, R. (2013). A solution to the mysteries of morality. *Psychological Bulletin*, 139, 477–496.
- DeScioli, P., & Pinker, S. (2022). Piled modifiers, buried verbs, and other turgid prose in the *American Political Science Review*. *PS: Political Science and Politics*, 55, 123–128.
- DeScioli, P., & Wilson, B. J. (2011). The territorial foundations of human property. *Evolution and Human Behavior*, 32, 297–304.
- Dorus, S., Evans, P. D., Wyckoff, G. J., Choi, S. S., & Lahn, B. T. (2004). Rate of molecular evolution of the seminal protein gene SEMG2 correlates with levels of female promiscuity. *Nature Genetics*, 36(12), 1326–1329.
- Fiske, A. P. (1992). The four elementary forms of sociality: Framework for a unified theory of social relations. *Psychological Review*, 99, 689–723.
- Fraser, B. (1998). Threatening revisited. *Forensic Linguistics*, 5, 159–173.
- Gangestad, S. W., & Simpson, J. A. (2000). The evolution of human mating: Trade-offs and strategic pluralism. *Behavioral and Brain Sciences*, 23, 573–587.
- Gurven, M. (2004). To give and to give not: The behavioral ecology of human food transfers. *Behavioral and Brain Sciences*, 27, 543–559.
- Haidt, J. (2012). *The righteous mind*. New York: Vintage Books.
- Hauser, M. D. (2006). *Moral minds*. New York: Springer.
- Holekamp, K. E., Sakai, S. T., & Lundrigan, B. L. (2007). Social intelligence in the spotted hyena (*Crocuta crocuta*). *Philosophical Transactions of the Royal Society, B: Biological Sciences*, 362, 523–538.
- Jackendoff, R. (1999). The natural logic of rights and obligations. In R. Jackendoff, P. Bloom, & K. Wynn (Eds.), *Language, logic, and concepts: Essays in memory of John Macnamara* (pp. 67–95). Cambridge, MA: MIT Press/Bradford.
- Jackendoff, R. (2009). The natural logic of morals and of laws. *Brooklyn Law Review*, 75, 383–407.
- Kaplan, H., & Hill, K. (1985). Food sharing among ache foragers: Tests of explanatory hypotheses. *Current Anthropology*, 26, 223–246.
- Kaplan, H., Hill, K., Lancaster, J., & Hurtado, A. M. (2000). A theory of human life history evolution: Diet, intelligence, and longevity. *Evolutionary Anthropology*, 9, 156–185.
- Kaplan, H. S., Schniter, E., Smith, V. L., & Wilson, B. J. (2012). Risk and the evolution of human exchange. *Proceedings of the Royal Society B: Biological Sciences*, 279, 2930–2935.
- Kokko, H., Lopez-Sepulcre, A., & Morrell, L. J. (2006). From hawks and doves to self-consistent games of territorial behavior. *The American Naturalist*, 167, 901–912.
- Kurzban, R., DeScioli, P., & Fein, D. (2012). Hamilton vs. Kant: Pitting adaptations for altruism against adaptations for moral judgment. *Evolution and Human Behavior*, 33, 323–333.
- Lieberman, D., Billingsley, J., & Patrick, C. (2018). Consumption, contact and copulation: How pathogens have shaped human psychological adaptations. *Philosophical Transactions of the Royal Society, B: Biological Sciences*, 373, 20170203.
- Lieberman, D., & Patrick, C. (2018). *Objection: Disgust, morality, and the law*. Oxford: Oxford University Press.
- Low, B. S. (2015). *Why sex matters*. Princeton: Princeton University Press.
- Lukas, D., & Clutton-Brock, T. H. (2013). The evolution of social monogamy in mammals. *Science*, 341, 526–530.
- Maynard Smith, J. (1982). *Evolution and the theory of games*. Cambridge, UK: Cambridge University Press.
- Maynard Smith, J., & Harper, D. (2003). *Animal signals*. Oxford: Oxford University Press.
- Petersen, M. B. (2015). Evolutionary political psychology. In D. M. Buss (Ed.), *The handbook of evolutionary psychology* (2nd ed., pp. 1084–1100). Hoboken, NJ: Wiley.
- Pinker, S. (2007). *The stuff of thought: Language as a window into human nature*. London: Penguin.
- Pinker, S. (2014). *The sense of style*. New York: Penguin Books.
- Pinker, S. (2018). *Enlightenment now: The case for reason, science, humanism, and progress*. New York: Penguin.
- Robinson, P. H., & Kurzban, R. (2006). Concordance and conflict in intuitions of justice. *Minnesota Law Review*, 91, 1829–1907.
- Robinson, P. H., Kurzban, R., & Jones, O. D. (2007). The origins of shared intuitions of justice. *Vanderbilt Law Review*, 60, 1631–1688.
- Schelling, T. C. (1960). *The strategy of conflict*. Cambridge, MA: Harvard University Press.
- Shaw, A., DeScioli, P., Barakzai, A., & Kurzban, R. (2017). Whoever is not with me is against me: The costs of neutrality among friends. *Journal of Experimental Social Psychology*, 71, 96–104.
- Stake, J. E. (2004). The property 'instinct'. *Philosophical Transactions of the Royal Society of London B*, 359, 1763–1774.
- Sznycer, D., & Patrick, C. (2020). The origins of criminal law. *Nature Human Behaviour*, 4, 506–516.

- Tetlock, P. E. (2003). Thinking the unthinkable: Sacred values and taboo cognitions. *Trends in Cognitive Sciences*, 7, 320–324.
- Thomas, K. A., DeScioli, P., Haque, O. S., & Pinker, S. (2014). The psychology of coordination and common knowledge. *Journal of Personality and Social Psychology*, 107, 657–676.
- Thornhill, R., & Gangestad, S. W. (2008). *The evolutionary biology of human female sexuality*. Oxford: Oxford University Press.
- Tybur, J. M., Inbar, Y., Güler, E., & Molho, C. (2015). Is the relationship between pathogen avoidance and ideological conservatism explained by sexual strategies? *Evolution and Human Behavior*, 36, 489–497.
- Tybur, J. M., Lieberman, D., Kurzban, R., & DeScioli, P. (2013). Disgust: Evolved function and structure. *Psychological Review*, 120, 65–84.
- de Waal, F. (2016). *Are we smart enough to know how smart animals are?* New York: W. W. Norton & Company.
- Weeden, J., & Kurzban, R. (2013). What predicts religiosity? A multinational analysis of reproductive and cooperative morals. *Evolution and Human Behavior*, 34, 440–445.
- Weeden, J., & Kurzban, R. (2014). *The hidden agenda of the political mind*. Princeton: Princeton University Press.
- Wiessner, P. (1996). Leveling the hunter: Constraints on the status quest in foraging societies. In P. Wiessner, & W. Schiefelhövel (Eds.), *Food and the status quest* (pp. 171–192). Oxford: Berghahn Books.
- Young, R. L., Ferkin, M. H., Ockendon-Powell, N. F., Orr, V. N., Phelps, S. M., Pogány, Á., ... Hofmann, H. A. (2019). Conserved transcriptomic profiles underpin monogamy across vertebrates. *Proceedings of the National Academy of Sciences*, 116, 1331–1336.