Truth-making institutions: From divination, ordeals and oaths to judicial torture and rules of evidence

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ABSTRACT

In many human societies, truth-making institutions are considered necessary to establish an officially valid or "received" description of some specific situation. These range from divination, oaths, and ordeals to judicial torture or trial by jury. In many cases, these institutions may seem odd or paradoxical, e.g., why would an ordeal reveal a defendant's guilt or innocence? Here we propose to address the questions, why those institutions are considered the source of accepted truth, and why they have recurrent features in many different cultures. Our model is based on two well-documented set of evolved cognitive mechanisms. One is epistemic vigilance, the set of cognitive processes that help us evaluate the quality of communicated information we receive. We show how our epistemic intuitions account for otherwise puzzling aspects of divination, oaths, and ordeals. The other set of mechanisms consists in human capacities for coalition building and the recruitment of social support, which explains how truth-making institutions can be strategically used by individuals to influence mutual knowledge for their own interests. Taken together, these mechanisms explain the kinds of institutions found in small-scale societies (oaths, ordeals, divination), as well as the emergence of different institutions (laws of evidence, judicial torture, trial by jury) in large-scale and modern societies.

In many human societies, people participate in institutional interactions, the point of which is to deliver officially valid statements about particular states of affairs, for instance, to establish who is guilty of a crime, what is the actual cause of some misfortune, or whether the gods favor us in the current war. The goal is not to deliver *generic*, *personal* knowledge (e.g. whether people believe some food is edible), but to produce official, "received," or *guaranteed* descriptions of *specific* states of affairs (e.g. whether people can publicly say that one specific individual is guilty of one specific crime). Institutions of this kind, from oaths and ordeals to divination or judicial torture, are common across human cultures, and display remarkably recurrent features, as a brief review will make clear.

What we call here *truth-making institutions* often seem paradoxical or counter-intuitive to outsiders. How could casting dice in a divination procedure reveal what made someone sick? How could confessions extracted through torture be reliable? Why demand that people take an oath, when perjurers are unlikely to be caught?

We argue that the existence of these institutions and their recurrent, often puzzling features are best explained in terms of two sets of evolved psychological mechanisms, a) epistemic vigilance, the set of cognitive

adaptations that optimize the value of information received from others, as well as b) dispositions and capacities for coordination, for rules that optimize individual benefits by regulating social support and strategic alliances.

1. Varieties of truth-making institutions

Before proposing a model of these institutions, we offer a fragmentary catalogue of ways in which people in different cultures create guaranteed information (i.e. information that people are normatively compelled to say they accept). The anthropological and historical record shows that [a] there are only a few types of such institutions, that is, types of processes that people see as delivering guaranteed information, and [b] within each of these types, we find common underlying principles. We do not intend to present an exhaustive list of truth-making procedures here, focusing instead on the most cross-culturally recurrent ones—although rarer forms of truth-making institutions share many commonalities with those presented here (e.g., trial by battle, Leeson, 2011, various types of lie detectors, Mercier, 2020b).

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1.1. Divination

In most societies in the world, and throughout most documented history, human societies have used divination procedures (throwing dice, burning a tortoise shell, poisoning a chicken, etc.) that determine the contents of a statement, thereby guaranteeing its validity as a description of an inscrutable state of affairs (what witches are responsible for your illness, whether your crops will thrive, etc.) (Curry, 2013; Johnston & Struck, 2005; Loewe & Blacker, 1981). Although there is an extensive anthropological and historical literature on divination, there is little by way of explanation for the general phenomenon (Boyer, 2020).

Divination procedures are found the world over and use a great variety of materials, but with similar principles. There is an established procedure, e.g., cast dice, throw a bagful of small bones in the sand, draw a random card from a shuffled pack, burn a tortoise shell, drop soggy tea-leaves on a saucer, etc. There is also, in most cases, a conventional interpretation of the patterns, e.g., that the queen of spades presages death or that one bone lying atop another is a sign of witchcraft. These supposedly provide relevant, guaranteed information about a question that is, in most cases, raised before the whole process starts, e. g., why is my father sick? What makes my crops wither? Who will win the battle?

A universal feature of divination is "ostensive detachment", that is, the assertion that the diviner (when there is a specialist) or the client are *not* responsible for the contents of the statement. Many forms of divination use randomizing techniques (e.g., drawing cards, casting dice, etc.) as a way to demonstrate that the operator cannot control the outcomes of the procedure, and therefore the contents of their statements about the situation at hand. Many specialists also make explicit comments to the effect that they are not venturing their own opinion, but are only reporting what the divination says (Boyer, 2020).

1.2. Ordeals

Ordeals are procedures used to determine guilt or innocence by submitting the accused to dangerous or painful tests, where guilt is associated with a worse outcome (following Mercier, 2020b). In many cultures someone accused of a crime might be asked to ingest a potentially poisonous substance; if they get sick, or die, they are deemed guilty. Or the accused might be asked to hold a red-hot iron in their hand while walking several steps. If the burned hand shows signs of infection after a few days, they are deemed guilty. This type of practice is found in many cultures, with major clusters in Europe and Africa, but also some instances in Asia (Roberts, 1965). Ordeals (under our somewhat restrictive definition) nearly all make use of poison, burning (by embers, or an iron), or scalding (putting one's hand in a pot of boiling liquid). People assume that the consequences of these dangerous courses of action will be more damaging for the guilty than for the innocent. Ordeals are a form of truth-making institution, in that the outcome of the ordeal is a guaranteed verdict on who was telling the truth.

1.3. Oaths

A public oath is "a solemn, usually formal calling upon God or a god to witness to the truth of what one says or to witness that one sincerely intends to do what one says" (Webster definition cited by Roberts, 1965, p. 186). Oaths are very prevalent worldwide. In many cultures oaths do not call upon any supernatural agent, but instead an abstract entity like the Constitution or the Nation, meaning that we can define an oath more generally as a mutually accepted way of unambiguously signaling a maximum degree of commitment to some statement. Here we consider decisive judicial oaths: if a party swears an oath (e.g. claiming their innocence), then the matter must be accepted by all as settled (for examples in medieval England, see, Fisher, 1997). Decisive oaths in particular thus appear to be a truth-making institution.

At first sight, it makes little sense that oaths should be truth-making.

They are often accompanied by an explicit or implicit threat of supernatural misfortune in case of perjury, e.g., "May I split inside if I was her lover" (Gluckman, 1967, p. 101). But the risk that such misfortune happens (e.g. the risk that the oath-taker suffers from some internal illness) is unrelated to the veracity of the statement. As a result, mentioning such supernatural misfortune should not grant the statement any extra credibility. To make things worse, decisive oaths are often sworn when it is unlikely that evidence will come to light allowing the judge or the community to later establish that the oath-taker committed perjury.

1.4. Previous approaches: Cultural assumptions and rationality

The historical and anthropological literature does not include a systematic treatment of features common to these institutions, nor do we find a general model of how institutions could produce officially recognized truths – see discussion in Mercier (2020b), and Boyer (2020). Rather, detailed descriptions of specific cases are usually accompanied by off-hand explanations, with the implication that those are almost self-evident.

1.4.1. Divination: Communication from gods, or cultural axiom

Anthropological accounts of divination often describe trust in divination as the consequence of specific cultural beliefs, to the effect that divination provides messages from the gods, ancestors, etc. (Beattie, 1964, p. 44). Now, although participants sometimes use that description (e.g., "the ancestors have spoken"), in many places people practice divination without thinking that its statements come from gods. That is the case for secular people who consult mediums, in modern societies (Favret-Saada, 1980), but also for the interpretation of omens in antiquity (Loewe & Blacker, 1981).[1] Other anthropological accounts of divination procedures suggest that trust in specific statements from divination stems from the culturally transmitted meta-belief, that divination does deliver truth. This interpretation would raise the subsequent question, why people would hold that meta-belief. But, as it happens, the ethnographic record is full of cases in which people do the opposite of what that interpretation would suggest – that is, they do claim that divination is reliable, but they are suspicious of many particular divination statements (Boyer, 2020; Holbraad, 2012).

1.4.2. Ordeals: Prior beliefs or assertion of power

Similar to the arguments used to explain divination, scholars have argued that in some societies people simply have irrational beliefs in the power of some deity to tell the guilty from the innocent (e.g., Posner, 1998; Van Caenegem, 1990). Recently, Leeson put forward a more sophisticated version of this explanation (Leeson, 2012; see also Leeson & Coyne, 2012): early medieval Europeans would have held such a strong belief in God's omniscience and power that the clergy used this belief to turn ordeals into an actual test of guilt. The innocent would accept to undergo the ordeal (believing they wouldn't be affected thanks to God's intervention), while the guilty would simply confess. The clergy would then rig the procedure to ensure that the ordeal would find people innocent. One problem with this explanation is that it rests on two premises that are less than parsimonious, namely: a) an extreme faith in God, which does not fit evidence about the religious beliefs of such communities (see, e.g., Milis, 1998; Mercier, 2020a), as well as b) a complete confidence that the clergy would administer the trial honestly, when in fact accusations of bribery and cheating were very common

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[1] Even if it was generally true that people see divination as divine messages, this would raise other questions, e.g., Why would people believe that the gods are actually talking? And why believe that the gods say the truth? This kind of interpretation seems to lead to an unending circular justification, whereby people trust their cultural institutions because they are established, and they are established because they are trusted.

(Bartlett, 1986; Brown, 1975, p. 139; Hyams, 1981, p. 94; Van Caene-gem, 1965, p. 307; for other examples, see, Ibos: Basden, 1966, p. 225; Ila: Smith & Dale, 1920, p. 356).[2]

Another explanation for the ordeal makes of the costs imposed on those who undertake the ordeal—the pain, the risks—their main feature, suggesting that they ordeals constitute a way of asserting power by punishing some individuals (Bartlett, 1986). This explanation fails to account for puzzling features of the ordeal, such as the supernatural justification: there are more straightforward, and thus presumably more efficient, ways of asserting one's power by punishing others. Moreover, ordeals are typically practiced in societies without the kind of strong central power that might wish to, and be able to assert itself in such a way (Roberts, 1965, p. 208, for an extended argument, see Mercier, 2020b).

1.4.3. Oaths and immanent justice

Most general descriptions of oaths simply mention that they are used to convey the speaker's higher degree of commitment to the veracity of a statement. In this sense, an oath would consists of a statement accompanied by relevant meta-information. That is certainly how informal oaths are formulated and received. But this description of oaths as commitment devices seem insufficient to explain the effects of decisive oaths, as they are typically sworn when the speaker's commitment can be simply anticipated by their incentives (i.e. the high stakes in persuading others), and is of little value (since the statements often can't be later verified).

Another explanation for the oath draws on one of their highly recurrent properties: the mention of misfortune that will befall the speakers if they are not truthful. Similarly to the ordeals, it could be suggested that people expect other community members to be such strong believers in whatever deity is supposed to punish them that they would not dare perjure themselves, thereby making the oath a credible commitment device. It is true that stories about perjurers suffering misfortunes are often found in cultures that use oaths (e.g. Davies & Fouracre, 1992, p. 15; Olson, 2000 note 53; Opie & Opie, 2001, p. 121ff). However, this explanation is unconvincing for several reasons. First, in many cultures the misfortune supposed to follow a perjury is not linked to any feared supernatural entity (no entity might be mentioned at all, or it could be a human instead of a supernatural entity, see Mercier, 2020b). Second, even in cultures linking oaths to supernatural punishments, people often noted, and deplored the prevalence of perjury (see, e.g., Kerr, Forsyth, & Plyley, 1992, p. 574). Given that people were keenly aware of the possibility of perjury, it is not clear why they would have granted some oaths the power to create guaranteed truth by being sufficient to sway a verdict.

1.4.4. Economic rationality of truth-making

A more promising approach is that of Peter Leeson, who in many publications has demonstrated that apparently strange institutions, including some truth-making institutions, are quite compatible with normative rationality (Leeson, 2009; Leeson, 2012; Leeson, 2013; Leeson & Coyne, 2012). For instance, although ordeals by poison may seem epistemically weak, Leeson and Coyne argue that, in the places where they are used, they offer some advantages over the available alternatives (Leeson & Coyne, 2012).

One great advantage of this approach is that it explains these

culturally widespread behaviors by drawing on (at least in part) rational processes. That is particularly important in this domain, as many truth institutions were traditionally described in anthropology in terms of unwarranted beliefs and a suspension of rationality. Indeed, such institutions were central to "rationality debates" in cultural anthropology, and were often interpreted as indicating that different cultures have different standards of rationality (Hollis & Lukes, 1982; Skorupski, 1975).

In the model proposed below, while we don't draw on the same models of economic rationality that inspired Leeson, we do argue that people who take part in truth-making institutions are guided by adaptive cognitive mechanisms, in particular mechanisms dealing with epistemic vigilance, and with coordination in cooperation.

1.5. Two questions for an evolutionary account

This short survey of common truth-making institutions illustrates that a) they are present in many human societies—there are few social groups without any divination, ordeals, or oaths—and that b) their rules are cross-culturally recurrent. Making the contents of a statement dependent on an uncontrolled process (divination) or coercing people to face extreme pain as a guarantee of their statements (ordeals)—these processes occur in remarkably similar ways in otherwise extremely different societies. In our view, an evolutionary perspective should address two fundamental questions:

[1] Why do people consider that these specific rules produce guaranteed truths? Seen from the outside, it appears difficult to understand in what way a random process like divination is better than asking knowledgeable individuals for their best guesses, or why anyone should resort to ordeals to establish guilt or innocence. To explain that, we must examine the practices described above in the context of human capacities for evaluating information, our epistemic vigilance.

[2] What motivates people to take part in these institutions? As we will argue when answering question [1], our epistemic vigilance mechanism do not yield the intuition that we should accept the outcome of truth-making institutions. Instead, epistemic vigilance suggests that truth-making institutions provide answers that are less bad than the alternatives, which doesn't explain why people would prefer these answers to no answer—especially given the time and effort that taking part in truth-making institution involves. There are many courses of action that can provide additional information on a situation, so a proper model of truth-making institutions should explain why those rules (and not each of their specific outcome) seem compelling in many social situations. To explain that, we must consider issues of coordination, and in particular the costs and benefits associated with producing an official or "received" account of various social situations.

2. How institutions (may seem to) produce truths

For all aspects of their lives, humans rely on communication. If it brings many benefits, this reliance on communication is also risky: senders often have incentives to send information that benefits them, but not the individual receiving the information. In humans, the risk raised by harmful communicated information is mitigated by a suite of cognitive mechanisms that evaluate messages, i.e., mechanisms of epistemic vigilance (Mercier, 2020a; Sperber et al., 2010). These mechanisms weigh messages by paying attention to their content and their source. For instance, people are more likely to accept messages that fit with their prior beliefs, or that are supported by arguments they find intuitively compelling (see, e.g., Mercier & Sperber, 2017; Yaniv & Kleinberger, 2000). People are also more likely to accept messages coming from individuals deemed more competent, or who are thought to have their best interests at heart (see, e.g., Bonaccio & Dalal, 2010). Particularly important is the sender's ability to commit to the message: the more the sender can be held responsible if the message turns out to be harmful, the more believable the message is (e.g., Vullioud, Clément,

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[2] Another argument against Leeson is that ordeals, even though they did not always establish guilt, were mostly administered to people thought to be guilty (see e.g., Kerr et al., 1992, p. 577; Reynolds, 1997, p. 25, and discussion in Mercier (in press). That some defendants were found innocent might seem surprising. How is one supposed not to show traces of infection three days after having held a red hot iron for some time, the telltale sign of innocence? In fact, any infection would only erupt later, such that even people who have been burnt might be deemed innocent (Kerr et al., 1992).

Scott-Phillips, & Mercier, 2016). By contrast, when receivers perceive (rightly or not) a conflict of interest between themselves and the sender, they readily discount the messages (e.g., Sniezek, Schrah, & Dalal, 2004). A wealth of evidence shows that both adults and children exert epistemic vigilance competently (Harris, Koenig, Corriveau, & Jaswal, 2018; Mercier, 2020a).

These epistemic vigilance mechanisms often rely on prior knowledge about the sources of communicated information, but they also further inform our opinion about sources. A source who transmits a message that turns out to be false or harmful will see their reputation decrease (e. g. Altay, Hacquin, & Mercier, 2020). By contrast, a source that transmits a particularly insightful or helpful message will see their reputation improve. This provides incentives for sources to transmit helpful messages, and to avoid transmitting harmful messages. These incentives shape which messages sources decide to send, and how they present these messages. For example, sources attempt to claim credit for other people's good ideas, but they are less inclined to do so when they are more likely to be found out (Altay, Majima, & Mercier, 2020; see also, e. g., Silver & Shaw, 2018).

That humans are endowed with such efficient epistemic vigilance mechanisms only makes the institutions reviewed here seem paradoxical. Efficient epistemic vigilance mechanisms should tell us that throwing chicken bones, or waiting for misfortune to strike a perjurer, are not sound ways of ascertaining the truth of a statement. Even worse, divination, oaths with supernatural punishment, and ordeals appear to violate our intuitions about who is a good source (e.g. dice and tea leaves are not intuitively good information sources). Not only are these institutions apparently contradicting intuitions delivered by epistemic vigilance, they do so with striking cross-cultural regularity. How is that possible?

This apparent conflict between epistemic capacities and truth-making institutions can occur in two ways. First, when a *particular* statement made about a given situation conflicts with *particular* intuitions about the case, delivered by our epistemic psychology. For instance, the ordeal could reveal that "Paul is innocent of this crime" when we had believed him guilty. Undoubtedly, such conflicts will arise, although we should note that truth-making institutions are typically only used in the absence of a consensus (on what verdict is correct for oaths and ordeals, on what decisions is best for divination), and so in situations in which the outcome is unlikely to conflict with everyone's strong intuitions.

Still, given the existence of such conflicts, why, would people accept the outcome of an apparently bizarre truth-making institution over their intuitions? To understand that, one must take into account the distinction between intuitive and reflective beliefs. Intuitive beliefs are mental representations that appear without deliberation, as the result of the automatic activation of specialized cognitive systems, and that can interact with any other inferential mechanisms, including those guiding our behavior (Cosmides & Tooby, 2000; Sperber, 1997). Reflective beliefs, by contrast, belong to the domain of explicit, sometimes deliberate representations that explain, extend, restrict the scope of, or comment on intuitive representations (Baumard & Boyer, 2013). In logical terms, they are meta-representations, such as "'p' is true" by contrast with the representation "p" (Cosmides & Tooby, 2000; Sperber, 2000).[3]

This is important as the statements delivered by truth-making institutions trigger reflective rather than intuitive beliefs. If an individual exculpates himself by undergoing an ordeal, e.g., by walking on fire, this triggers the belief "according to the rules of the ordeal 'the accused is

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innocent,'" not the belief "the accused is innocent." In the same way, a divination procedure will trigger the belief "the cards said that 'your grandmother is a witch,'" which is not the same mental representation as the intuitive belief "your grandmother is a witch" (on the reflectiveness of witchcraft beliefs, see, e.g. Mercier, 2020a) People can maintain the reflective belief activated by use of a truth-making institution, without necessarily being committed to the embedded belief that is described as guaranteed, and without acting on its basis.

That people hold the outcome of truth-making procedures as reflective beliefs minimizes the conflicts between these outcomes and our epistemic intuitions. However, there seems to also be conflicts between the *general* representation of the institutional rules (e.g., "the tea leaves will tell who the witch is") and *general* premises of our epistemic systems (which don't point to tea leaves as reliable information sources).

Here, we argue that in fact the truth-making institutions we have discussed here possess a crucial trait make them compelling for our epistemic vigilance mechanisms: ostensive detachment.

We mentioned above that epistemic vigilance examines a number of cues pertaining to the source and content of messages to ascertain how much weight to grant them. One of the—if not the—most crucial of the source cues is self-interest: self-interested statements are inherently mistrusted by everyone, including small children. Moreover, if some of the cues processed by epistemic vigilance might remain somewhat opaque, self-interest is frequently explicitly discussed as a reason for mistrusting someone's statements.

Affecting the self-interest factor means finding rules that diminish the potential benefits that speakers may accumulate at the listeners' expense, if they are believed. In societies with large resources, it is possible to train and appoint professional judges or investigators, and monitor their behavior to ensure this goal. In simpler economies, truth-making institutions rely on ostensive detachment to remove the issue of self-interest: it is the gods (for instance) that speak through tea leaves, the eruption of an infection on the accused's hands, or the misfortune that strikes the perjurer. Even if our epistemic intuitions do not direct us to trust, say, tea leaves, they should make rules that remove self-interest as a consideration appealing. In some situations, a statement untainted by self-interest might be deemed preferable to the statement of any particular individual; in some situations, only tea leaves can produce such untainted statements.

3. How institutions (may) produce advantageous coordination

3.1. Why participate in truth-making institutions?

So far, we have described the connections between our epistemic intuitions, on the one hand, and truth-making institutions on the other. We have argued that the specific output of truth-making institutions (e. g. "Paul is guilty") rarely directly clashes with our epistemic intuitions, since the former remains a reflective belief, and thus insulated from the latter. We have also suggested that one crucial aspect of truth-making institutions fits our intuitions about how such institutions should function: through ostensive detachment, truth-making institutions eliminate concerns about self-interest. If this helps explain why people might favor truth-making institutions over some alternatives—e.g. if one individual were asked to make the same pronouncements in their name—it doesn't account for why truth-making institutions exist at all. Why should they be favored over nothing? Why are they used in particular situations? And, What effects do people expect from their use?

Anthropological accounts report how people feel motivated to organize ordeals or divination. Divination, judicial oaths, and ordeals are used to establish, for instance, who is responsible through mystical means for someone's misfortune, accident, or failure, or who committed an actual crime. Whether there is a witch in one's social environment, or an actual murderer, may seem to most readers to be rather pressing matters, as is the question of who that individual actually is.

But there is nothing self-evident about this motivation. In principle, a

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[3] For instance, detecting the facial expression of irritation on our interlocutor's face may trigger an intuitive belief that "she is annoyed with me." Representing "maybe I should not have commented on her divorce" adds a commentary to that belief, in the form of a reflective belief that would explain the intuitive belief. Reflective beliefs may also suspend commitment to the intuitive belief, e.g., "but she's sick, maybe she's just in pain" (Sperber, 1997).

community could react to misfortune by doing nothing at all, and that indeed is what happens for many individual vicissitudes. Or, even if a trial takes place after a crime is suspected, the absence of a verdict could seem preferable to having recourse to ordeal or decisive oaths. In fact, especially in small-scale communities, people in some situations feel that resorting to specific truth-making procedures is necessary. Explaining why that is the case requires that we focus on the effects of the statements delivered by such institutions, and explain how they activate evolved motivations for increasing one's individual welfare through social interaction. This perspective, in our view, best explains why truth-making institutions may seem intuitively useful to many participants, and why they are used in specific types of situations.

3.2. Received opinion, social support and alliance psychology

In any human community, people constantly exchange information describing external states of affairs, including general facts ("apples ripen in the fall") or specific situations ("Alexandra had the flu last year"). Individuals evaluate the veracity of these messages thanks to their epistemic vigilance mechanisms. This results in agents' individuals beliefs. As different individuals activate highly similar epistemic intuitions, they often reach similar representations of a situation—in which case they have *shared* beliefs about that situation, which can be described as "common ground" (Lewis, 1969), "mutually manifest beliefs" (Sperber & Wilson, 1995) or "co-registered representations" (Cosmides & Tooby, 2000; Tooby & Cosmides, 2001). In some cases, shared beliefs constitute *mutual* knowledge, that is, each agent represents the fact that others share his/her own beliefs (Sperber & Baumard, 2012).

The truth-making institutions we described here produce a subset of mutual knowledge that is *normatively* accepted. That is, they produce "received" or "official" or "accepted" statements about some situation. The outcome of participation in ordeals, oaths, or divination is not so much a change in people's beliefs, as a change in what people can overtly claim to be their beliefs. For instance, after a defendant successfully passes a poison ordeal, it becomes received opinion that everyone must acknowledge their innocence, and treat them essentially as if they were innocent. That does not mean people will necessarily believe them innocent: witness to the poison ordeal may well have their own reservations about the outcome, they may suspect that the poison was not so dangerous, or suspect that the defendant had a secret antidote, and so forth. In the same way, many people will accept the result of divination as the official, accepted description of why some person fell sick, whilst entertaining private reservations about that diagnosis. In such cases, people's acceptance of received statements would constitute an instance of preference falsification, a discrepancy between private and public preferences (Kuran, 1995). This suggests that we can best approach the question, why people would participate in truth-making institutions, by focusing on the possible individual advantages of producing and accepting "received," i.e., normatively accepted descriptions of particular situations.

The relevant set of capacities and dispositions is human alliance or coalitional psychology (see, e.g., Kurzban & Neuberg, 2005; Pietraszewski, 2013a, 2013b; Tooby & Cosmides, 2010). Human fitness is crucially affected by the amount of support received from others, both because cooperation is an essential positive contributor to fitness, and also because individual and group conflict constitutes an important fitness threat. So an essential fitness requirement is to recruit social support both for one's direct benefit, and as a precaution against others setting up alliances against one (Neuberg & Cottrell, 2008). Social life, in the kind of small communities typical of our ancestral past, offers many opportunities for intense mutually profitable cooperation. It also offers ample opportunities for people to join forces and gang up on a target, on an individual who for some reason attracted hostile attitudes from one or several others.

That is why it would be of great advantage for one to monitor and

possibly influence other agents' representation of one's own behavior. That is true in terms of cooperation opportunities, as human cooperation is based on partner-choice (Baumard, André, & Sperber, 2013; Krasnow, Cosmides, Pedersen, & Tooby, 2012), which is made immensely more efficient by human memory and communication capacities. That is also true in terms of rival alliances in competition or conflict, since people join alliances on the basis of what they know about other agents' prior affiliation (Tooby & Cosmides, 2010).

In that context, the constitution of "received" opinion about situations of concern to most members of a group, may have important consequences for each individual's welfare, which in our view explains how people may see their own individual participation in truth-making institutions as strategically advantageous.

3.3. Coordination effects of truth-making institutions

3.3.1. Situations in which truth-making is relevant
In our view, support-recruitment motivations and our broader alliance psychology explain why people may in some conditions have the intuition that it would be advantageous to resort to truth-making institutions. We hypothesize that people will typically use truth-making procedures to address situations in which [a] a particular state of affairs is inscrutable, although [b] what that state of affairs actually is, matters greatly to various members of the community; [c] there are potential costs in taking a position regarding the state of affairs—in other words, talk is not cheap in such contexts; and [d] there is a perceived benefit in reaching a mutually known description of what happened. These features are crucial to understanding the social dynamics involved in producing guaranteed statements. To illustrate these features, we can review the relevant aspects of the three kinds of institutions described above.

3.3.2. Divination
Consider a typical case of a small-scale community, faced with a case of illness that is attributed to witchcraft, as are many instances of misfortune. There is typically no empirical evidence for anyone in particular being a witch, so that the matter is intrinsically inscrutable (criterion [a]). In a small-scale community, with all social relations based on personal relations, being identified as the witch could carry a heavy cost for the target, in terms of restorative measures, as well as loss of status and loss of cooperative partners (Douglas & Evans-Pritchard, 1970; Geschiere, 2001). So most people would rather someone else was the target, which is why the matter is consequential (criterion [b]). Also, these are matters about which idle talk is often risky. In a group where most people know each other, one cannot and in fact does not go around making witchcraft, theft, or murder accusations, as these carry the risk of alienating the targets and their supporters (criterion [c]). Finally, these are situations in which people may intuitively perceive the benefits of agreement (criterion [d]). An official diagnosis puts an end to the discussions over who is a witch, which people see as costly, because it may turn out to target any individual including themselves, and also because it may lower the overall level of group cohesiveness and cooperation.

In such a situation, one has to ascertain who was responsible and what should be the appropriate reparation. Naturally, one could canvass members of the group as to their opinions about the matter at hand. However, this may feel intuitively unsatisfactory, for two reasons. One is that such matters are inherently inscrutable. Another reason is that, given what is at stake in providing a particular answer to the question, all statements are possibly tainted by self-interest, as people want to exonerate themselves or accuse particular others. This makes statements from all sources equally suspicious. Because of ostensive detachment, divination procedures suggest that one expected flaw of many sources (the influence of strategic interests) is removed (Boyer, 2020). It is therefore in the interests of most individuals, except the target of accusation, to use such a procedure, which delivers a received opinion

about the case.

3.3.3. Ordeals and decisive oaths

As mentioned above, decisive oaths and ordeals are used in judicial settings, typically when more intuitive forms of evidence such as eyewitness testimony have proven insufficient to reach a consensus. Criteria [a] and [b] are thus met: there is no way of clearly ascertaining whether someone is guilty, and yet whether someone is guilty matters hugely not only to that individual, but to many members of the community. For the same reasons as in the case of witchcraft, there are potential costs in accusing people who may have their own coalitional allies and retaliate against the accuser (criterion [c]). All this makes it desirable to create an officially accepted verdict (criterion [d]), at least so that the dispute can be settled (a main goal of trials in small-scale societies being conflict resolution, see S. Roberts, 1979).

In such a situation, it is beneficial for most community members if a verdict can be delivered, but members might be unwilling to take responsibility for the verdict. If there's a presumption of guilt, but insufficient evidence, many people in the community might wish to punish the accused, but have no obvious way of legitimately doing so. An ordeal offers a potential solution to this problem. By offering the accused the choice of either confessing or submitting to the ordeal, the judges (and the community more generally) avoid having to actually deliver a verdict, since the verdict is now in the hands of the accused (if they confess), or, nominally, of a supernatural entity if the accused chooses to undergo the ordeal.

In this sense ordeals inflict a cost on people thought to be guilty of a crime (see, Mercier, 2020b). True, as Leeson (2012) pointed out, ordeals (in Europe at least) often led to verdicts of innocence, which seems incompatible with the idea that they were mostly imposed on people considered guilty. However, even if there was a chance one could be found innocent, the ordeal would still have inflicted clear costs, from the ordeal itself, and the non-zero odds that one is found guilty. These costs could also be used to credibly signal how much one was attached to a given verdict. People sometimes willingly underwent the ordeal in an attempt to prove their innocence, in which case they were credibly signaling the importance of the verdict for them (as in the case of decisive oaths, but with a much higher cost).

The logic of decisive oaths with supernatural punishment is similar to that of the ordeal: they also constitute a way of inflicting a cost on one of the parties, without anyone taking responsibility for this cost. Even when there is not enough evidence to decide on a verdict, most members of a community have an advantage in reaching a decision that is agreed by most. It is not unreasonable, then, that the verdict should favor the individual who values it the most. One way of credibly signaling that one is really attached to obtaining a verdict in one's favor is to swear an oath with a link to a supernatural punishment (see, Mercier, 2020b). Once such an oath has been sworn, the community interprets some misfortune befalling the oath-taker (or their family) as a sign that they had lied. The oath-taker will then pay a cost: not only will the verdict be reversed, but they will suffer some penalty for perjury. For example, Tokugawa law prescribed a specific set of misfortunes that would be diagnostic of perjury, a specific time frame for these misfortunes to happen, and harsh penalties for perjurers (Ishii, 1964). So, even if taking the oath does not affect the odds of a misfortune happening, it significantly increases the costs should such misfortune occur (and such misfortunes are bound to happen sometimes through ill-luck). When taking a decisive oath mentioning some misfortune, one therefore takes a costly risk, thereby honestly communicating ones' desire to obtain a given verdict. Crucially, whether the extra cost is actually borne or not isn't in the hand of any specific individual, but is largely down to luck (i.e. whether a misfortune happens or not).

3.3.4. General properties

Coordination around particular official statements requires not just that many people accept that the statement produced is authoritative, but also that they expect others to do so too, and expect others to expect the same from everyone else. That is why the rules that constitute a truth-making institution cannot be entirely arbitrary, and are in fact constrained by the epistemic intuitions described above (Section 2).

In all three cases described here, truth-making institutions make it possible to form a "received" description of what happened that is mutual knowledge, because all participants share the same epistemic intuitions. For instance, in the case of divination, a participant who has the intuition that ostensive detachment alleviates the problem of judgements tainted by self-interest, can also assume that others entertain this intuition as well, and that others would expect most people to entertain it. So, you may entertain the assumption that divination-produced diagnoses of illness are (potentially) more compelling explanations than mere individual opinions. But you also entertain the assumption that others entertain that assumption, which makes it intuitively clear that others too will find divination statements compelling. A similar recursion occurs for ordeals. As accusers intuitively estimate the costs and benefits of getting an accusation settled by ordeals, they also implicitly expect others to have the same intuition. Oaths too have that property. As each witness perceives that an oath-taker increases the potential costs of false statements, by turning a simple lie into perjury, they can expect others to have the same intuition.

This recursion based on expectations of similar assumptions or preferences is not unique to truth-making institutions. In fact, it is very general in human coordination. As Tooby and Cosmides point out, "sharing the same evolved architecture provides a partial foundation for resolving the game theoretic problem of common knowledge with finite cognitive resources" (Tooby & Cosmides, 2010, p. 204). For example, people can mobilize others to attack a particular individual by describing the target's behavior as morally outrageous. Assuming that similar moral intuitions and feelings motivate individuals other than oneself, and assuming that others assume that, allows one to be confident which side others will take – all else being equal (Tooby & Cosmides, 2010, p. 226), see also (Kurzban & DeScioli, 2009) for similar dynamics of moralization.

4. Extension: Truth-making institutions and judicial systems

So far, we have considered truth-making institutions common in small-scale societies. But we also find truth-making institutions in larger polities, in judicial contexts in particular, taking the form of laws of evidence, the use of mandatory confessions, or, in some countries, trial by jury. Again, we cannot survey the many varieties of truth-making rules employed in judicial systems, but we can highlight how the most recurrent ones might make sense, in light of the two sets of processes identified in our model, a) the constraints from epistemic psychology and b) the motivation for producing coordination points.

The contrast we draw here between small-scale societies, with typically foraging or horticultural economies, and larger-scale, agrarian and industrial kingdoms and states, is of course an over-simplification of social evolution (Maryanski & Turner, 1992; Sanderson, 2014). Still, it serves to highlight two features that are crucial to truth-making institutions. First, in large-scale polities a significant share of investigation and punishment is taken over by a central political power, and imposed on the populace. Second, such polities are "impersonal" in the sense that people interact with individuals about whom they have much less information than in small-scale communities.

4.1. Law of evidence

In most human societies, there are trials, but no law of evidence. People rely on their intuitions to judge who's right or wrong, guilty or innocent. This is greatly facilitated by the fact that the people doing the judging (be they specific individuals or the community at large), often have intimate knowledge of the case and of the parties involved (see, e. g., Langbein, 1996). These are the perfect conditions for epistemic

vigilance to be exerted, and by all indications it seems to function reasonably well (see, e.g., Hutchins, 1980; Roberts, 1979).

When laws of evidence appear, we find strong cross-cultural regularities in the forms that they take. In each case, the laws match in a rather obvious manner intuitions delivered by epistemic vigilance. This may seem both rational, since the intuitions are reliable, but also redundant — if the rules match our intuitions, why do we need the rules at all?

In some cases, the rules of evidence express common intuitions of epistemic vigilance, but formulate them in abstract terms that omit all the implicit inferential work that triggers those intuitions in everyday contexts. For instance, it would seem that proscribing hearsay as a source of evidence (e.g. medieval Europe: Damaska, 1991; ancient Athens: Harrison, 1971, p. 145; ancient Hindu law: Rocher, 1964, p. 336) is consistent with our epistemic intuition that reported information is less reliable than direct perceptual experience. But we also know that in some cases hearsay is reliable and informative. In a similar way, the rules against bearing witness if you have a conflict of interest is a simple expression of our epistemic intuition that self-interested statements ought to be discounted. But, once formulated as a formal, absolute rule, this may lead to the conclusion that no one with any stake in the situation can testify, thus excluding the most relevant testimonies (e.g., medieval Islamic law: Brunschvig, 1964, p. 181; continental medieval Europe: Lévy, 1964, p. 147; ancient Hindu law: Rocher, 1964, p. 340).

One plausible interpretation is that these laws of evidence allow the judicial system (typically, judges) to deliver justifiable decisions. For example, a conviction based on hearsay might be difficult to justify to those not intimately familiar with the case, even if in fact there is every reason to believe the hearsay. Pressures for legitimacy have played an important role in shaping judicial institutions (e.g. Caldeira & Gibson, 1995; Clark, 2009; Gleeson, 2000; Stephenson, 2004), and the law of evidence fits this broader pattern.

In this perspective, the rules prove popular because they make explicit pre-existing intuitions. Even if our intuitions are more fine-grained that the rule, the rule appears broadly sensible. As a result, though the rules may be redundant and their epistemic benefits are often dubious, people can both justify the rule itself and use the rule to justify specific verdicts. In this sense, this situation is comparable to that of criminal justice, as laws that apportion punishment are constrained by intuitive moral understandings (Robinson & Kurzban, 2006), which explains why people can have highly similar intuitions about the severity of offences and of appropriate punishments, even in vastly different cultures (Sznycer & Patrick, 2020).

The combination of epistemic psychology and strategic interests may also explain apparently puzzling aspects of some laws of evidence, as for instance the stipulation that some categories of persons are excluded as possible witnesses (children, women, slaves, lower-ranking individuals, etc.) (e.g., medieval Islamic law: Brunschvig, 1964, p. 180; ancient Athens: Harrison, 1971, p. 136; medieval Europe: Olson, 2000, pp. 120–121). This may seem strange, given that these individuals might provide crucial evidence. Our intuition is that a statement is all the more persuasive as the speaker would lose reputation if it turned out to be false (for experimental evidence, see Vullioud et al., 2016; see also, e.g., Tenney, MacCoun, Spellman, & Hastie, 2007). In ancient societies, slaves for instance had the lowest status and could therefore not lose reputation by being considered liars—so it would make sense for free citizens to discount their statements. Women in some patriarchal societies are individuals without honor—their behavior only impacts their husband's, father's, or brothers' honor—which results in the intuition that their statements are less reliable (e.g. Brunschvig, 1964).

4.2. Confessions and judicial torture

One of the most cross-culturally robust patterns in the judicial systems of large-scale societies is the reliance on confessions. Many judicial systems have relied quasi-exclusively on confessions, from Tokugawa Japan (Ishii, 1964), to the ancient Middle-East (Boyer, 1964), China for most of its history (Conner, 2000) or Rome after Constantine (Thomas, 1986). To this day, many judicial systems overwhelmingly depend on straightforward confessions (e.g., Japan: Futaba & McCormack, 1984; China: Lu & Miethe, 2003), or on guilty pleas (e.g., in the U.S.: Missouri v. Frye, 2011).

Reliance on confessions always has been (and still is) accompanied by a variety of tactics used by law enforcement or the judiciary to extract confessions, ranging from police pressure (many contemporary jurisdictions, see, Peters, 1996), to outright torture (continental Europe after the thirteenth century, e.g., Langbein, 2012; China since the Han, Conner, 2000; Tokugawa Japan, Ishii, 1964; ancient Athens, Bonner, 1905; Rome after Constantine, Thomas, 1986; ancient India, Rocher, 1964; more generally, see Peters, 1996). These methods are associated with high rates of false confessions, even when torture is not legalized (e. g. Kassin & Gudjonsson, 2004).

Consider the example of medieval continental Europe. As reliance on ordeals faded in the thirteenth century, jurists developed a set of constraints that must be met if capital punishment is to be imposed (e.g., Lévy, 1964). These constraints meant (to simplify) that a verdict of capital punishment had to be grounded either in the testimony of two eyewitnesses, or in a confession by the accused. Given that few crimes have two eyewitnesses, most verdicts required a confession. However, this requirement would have provided an easy way out for the vast majority of the accused, including those against whom there was overwhelming evidence (short of two eyewitnesses), as they could simply refuse to confess. As a solution, jurists legalized judicial torture. For obvious reasons, torture leads to high rates of false confessions, which makes the development and stability of the institution puzzling.

One important epistemic consideration is that confessions are prima facie convincing. The accused who confess are supposed to know what they are talking about (their own actions), and not to be self-interested (especially if the confession leads to severe punishment). As a result, one might see the primacy of confessions as a straightforward application of epistemic vigilance (Sznycer, Schniter, Tooby, & Cosmides, 2015).

The intuitive persuasiveness of confessions is necessary but not sufficient to explain their judicial prominence—in particular when they are not only a de facto, but also a de jure requirement. First, other types of evidence can also be very convincing, so it is not clear why a confession should be required. Second, confessions are of course not persuasive when they are extracted under threatened or actual duress (Kassin & Wrightsman, 1980). In fact, most legal systems with legalized torture recognized this issue and attempted to find workarounds. For instance, one would consider the confession valid only if the defendant produced, under torture, information that only a guilty party could know (see, e.g., on medieval Europe, Fraher, 1989, p. 29; on Imperial China, see, Conner, 2000; Imperial Rome, Langbein, 2012, p. 8; ancient Athens, Harrison, 1971, p. 147). In that sense, many participants in such a system could assume that torture was just a convenient way to get the defendant to produce definitive evidence for what judges and others knew to be true all along.

The cultural success of torture and confessions may also stem from two features typical of large-scale societies. First, confessions are easier to share in a large population than other types of evidence. Second, they can more easily generate consensus about the verdict. Consider a case in which an overwhelming amount of circumstantial evidence (motive, material evidence, etc.) points to a particular individual. This might be sufficient to convince anyone familiar with the case, such as a judge or jury. However, the evidence is relatively difficult to communicate, as it involves many facts and their connections. As a result, in any but the smallest-scale societies, the majority of the population would not be apprised of all these facts, and therefore would not accept the justification for the verdict. By contrast, if the accused confesses, this information is very easy to transmit. Indeed, experimental evidence suggests that, as justifications for a verdict, confessions remain convincing across more episodes of transmission than circumstantial evidence or

eyewitnesses (Mercier, Claidière, & Hacquin, 2020). Their robustness in transmission would allow justifications based on confessions to spread through the population and create a consensus of public opinion more efficiently than other forms of justifications. Some European medieval jurists appear to have been aware of the legitimizing role of confessions, as they recognized that confessions were the easiest way to achieve "notoriety" for a verdict, that is, for the public to reach an agreement on its validity (Lévy, 1964, p. 162; on the legitimizing role of confessions in medieval evidence law more generally, see, Langbein, 2012).

5. Conclusion

Beyond superficial differences, decisive oaths, ordeals, or divination techniques are so similar that a visitor from a particular place would have no difficulty understanding the procedures adopted in another culture, however dissimilar that culture in other respects. We interpret these regularities as a consequence of cultural transmission between highly similar minds, whose architecture is the outcome of similar evolutionary principles.

According to the model proposed here, the rules that constitute truth-making institutions seem compelling and natural only to the extent that they satisfy particular constraints from epistemic vigilance systems, on the one hand, and coordination motivations on the other. Taken together, these two sets of evolved features in human psychology allow us to answer two distinct questions about truth-making institutions–first, why they emerge and seem compelling and efficient to participants; second, why they are so culturally successful, being widespread in many cultures the world over, with highly similar features.

This does not mean that truth-making institutions are an inevitable production of our evolved minds. All we claim here is that, given our cognitive dispositions, their rules appear compelling and their use advantageous. This would explain why such rules tend to be preserved across generations, despite the entropic nature of human communication, which inevitably creates slightly different versions of each rule, slightly degraded understandings of when to apply them. In our perspective, the various combinations of rules described here as truth-making institutions constitute cultural attractors, that is, positions in the conceptual space that are more likely than others to be instantiated in human cultures, because of evolved features of the minds that acquire, reconstruct and transmit information (Claidière, Scott-Phillips, & Sperber, 2014; Claidière & Sperber, 2007; Sperber, 1996).

This would explain why the transmission of such institutions does not require that their underlying principles be made entirely explicit. For example, no-one needs to explain to others why a new form of divination, in which the diviner and the client could better influence the statements produced, would be less compelling than the current procedure. No-one needs to stipulate that ordeals would be less convincing with a defendant who could not feel pain. Both epistemic vigilance and coordination motivations increase individual fitness benefits from social interaction. The properties of these cognitive capacities and dispositions illuminate the emergence and recurrent properties of many social institutions, including the pervasive and occasionally paradoxical institutions humans build to establish mutually agreed upon truths.

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