

Narrative as social Mapping Case Study: The Trickster Genre and the Free Rider Problem

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For the bulk of their evolution, *H. sapiens* and perhaps earlier hominid species have lived as hunter-gatherers in small groups of roughly 25 to 100 individuals (Lee & DeVore 1968; Kelly 1995) dependent upon one another for food (e.g., Cashdan 1983; Lee 1984; Rasmussen 1931; Tonkinson 1978; Wiessner 1982), health-care (Sugiyama & Chacon 2000), and defense (LeBlanc & Register 2003). It follows that a major selection pressure on ancestral humans was their own kind (Alexander 1989; Byrne & Whiten 1988; Flinn, Geary & Ward 2005): both in-group and out-group individuals could potentially further or foil one's survival and/or reproductive goals. Thus, our ancestors "needed to construct ... a social map of the persons, relationships, motives, interactions, emotions, and intentions that made up their social world" (Cosmides & Tooby 1992:163). Leda Cosmides and John Tooby argue that this hypothesis "must be substantiated by experimental evidence, as well as by converging lines of empirical support drawn from related fields such as neuroscience, linguistics, and anthropology" (1992:163). I propose that folklore be added to this evidence. There is a pronounced correspondence between the themes of world folklore and the challenges associated with navigating the social world (Scalise Sugiyama 1993, 2005). By enabling us to observe a wide range of human actions, personalities, relationships, emotions, and goals, narrative offers a low-cost means of enhancing our ability to predict and manipulate the behavior of others (Scalise Sugiyama 1996, 2005).

The prediction and manipulation of behavior is part and parcel of a larger human capacity. Our species' ecological niche — the way we make a living — is the cognitive niche (Tooby & DeVore 1987): what distinguishes humans from other animals is our highly developed ability to make cognitive models of our environment. John Tooby and Irven DeVore (1987) call this ability *causal* or *instrumental intelligence*, which they define as the ability to create and maintain cause-and-effect models of the world as guides for prejudging which courses of action will lead to which results. Causal reasoning enabled our ancestors to develop complex resource extraction techniques, such as locating game by tracking, capturing elusive animals through the use

of snares, traps, or lures, and neutralizing plant toxins by leeching or cooking. These complex techniques often entail modeling the social as well as the physical environment: game drives, for example, require coordinated human action and division of labor. In the case of Mbuti net hunting, men enclose an area of jungle with a net "fence" and women act as beaters, driving game into the enclosure (Turnbull 1983). The Washo used a similar technique, using brush instead of nets: some group members made the enclosure, others drove antelope toward it, and others shot the antelope once they were inside (Downs 1966). The use of game drives, then, entails modeling (1) applications of physical materials (e.g., brush can be used as an enclosure, plant fiber can be woven into a net, rock can be sharpened to pierce flesh), (2) animal behavior (e.g., loud noises cause certain animals to break cover and run in the opposite direction of the noise), and (3) human behavior (e.g., groups of humans can cause animals to run in a given direction by chasing them).

As the use of conspecifics to effect a plan suggests, cognitive modeling has applications beyond subsistence: it enables one to model possible actions — and reactions — of other human beings. If, for example, a group of strangers is encroaching on your territory, you can model different courses of action and possible outcomes in order to decide how to act. What might happen if you attack them? What might happen if you befriend them? What might happen if you do nothing? Nicholas Humphrey refers to this social application of modeling as a special case of "forward planning" (1988:19) and likens it to a chess game: any one move may provoke a variety of countermoves, to each of which the player must have a response planned (see also Alexander 1989).

As it turns out, good chess players have a large repertoire of board configurations in their memory, which gives them the advantage over less experienced players when calculating the potential ramifications of a particular move (de Groot 1966). By the same token, the more experience one has at observing human behavior, the better one will be at calculating the potential ramifications of a particular action. This is the essence of Humphrey's (1983) argument regarding what he calls "doing psychology." In this seminal work, Humphrey argues that, across human evolution, (1) individuals who were better at predicting the responses of conspecifics had higher survival rates than those who were less adept at this task, and (2) accurate predictions of behavior were positively correlated with depth and breadth of personal experience. He concludes that "the extension of inner experience should itself be a biologically adaptive trait in human beings" (1983:69). Richard Byrne makes a similar observation in the context of primate intelligence: noting that at least some chimpanzees appear to be capable of perceiving and applying resemblances between a past

experience and a present problem, he argues that this type of problem-solving involves “having plenty of similar past experiences to draw upon, and an efficient memory” (1995:85).

This is precisely the role that narrative plays in problem-solving: it extends “inner experience” by modeling different circumstances, actions taken in response to those circumstances, and the outcomes of those actions (Scalise Sugiyama 1993; 2005). As Steven Pinker puts it, “Characters in a fictitious world do exactly what our intelligence allows us to do in the real world. We watch what happens and mentally take notes on the outcomes of the strategies and tactics they use in pursuing their goals” (1997:541). Observing these outcomes expands our repertoire of life experiences, which we can reference and apply to the solution of present problems. It is important to note that these experiences are not necessarily “models for behavior” (Carroll 2004: xix), but models *of* behavior. Joe Carroll argues that the adaptive function of narrative must be something beyond mere information transmission on the grounds that, in his words, “I for one have made no use of [Samuel] Richardson’s model letters, and as a middle-aged, married male, I am unlikely to ever find myself faced with the interesting life choices [Anthony] Trollope depicts” (2004, xx). This argument misses the point: the information-transmission hypothesis posits that narrative models responses of conspecifics to given sets of conditions, and that the information gleaned from these models better enables us to predict and manipulate the behavior of conspecifics. This manipulation may or may not involve emulation of one or more of the behaviors modeled: for example, I might copy a character’s strategy in order to achieve my goal, or I might see a parallel between a character’s and a conspecific’s circumstances and use my knowledge of the former’s responses to predict and manipulate the responses of the latter. In the language of Cosmides and Tooby’s (1992:163) argument, narrative maps possible relationships, motives, interactions, emotions, and intentions that we may encounter in our social world. The listener may use that information for a variety of purposes, according to her interests.

One behavior-prediction problem that recurrently beset our ancestors is deceit. Group living inevitably leads to conflict, as individuals pursue goals that are at odds with those of their fellows. Through the use of deceit, one individual may cause another to engage in behavior that furthers the former’s goals and/or thwarts the latter’s. A subset of deceit is the free rider problem. To reduce certain risks and increase the odds of attaining certain goals, humans form alliances that involve delayed reciprocal exchange: one partner does a favor for the other with the understanding that the favor will be reciprocated at some future date. There is always a chance, however, that one’s partner will

cheat — that one will be tricked into doing a favor for someone who doesn't plan on reciprocating.

Although humans have cognitive adaptations dedicated to the problem of deceit (e.g., Axelrod 1984; Axelrod & Hamilton 1981; Byrne & Whiten 1988; Whiten & Byrne 1997), these adaptations only address facets of the problem that recur across time and cultures. Cognitive mechanisms cannot evolve to anticipate the particular stratagems that particular individuals in particular environments may invent to trick their fellows. Novel information must be acquired either from experience or from conspecifics. Acquiring novel information socially is often much more efficient and much less risky than acquiring knowledge at first hand, and humans are not the only animals to do so. Red-winged blackbirds, for example, learn the palatability of foods by observing what other red-winged blackbirds eat (Byrne 1995). What is striking about humans is the degree to which we learn socially: compared to other animals, we acquire a wider variety and greater quantity of information from conspecifics.

A few examples of the software requisite to human cultural transmission will suffice to make the point that humans are designed to acquire information from others, and to illustrate the complexity of this design. Michael Tomasello identifies a number of cognitive components of human cultural transmission that appear to be absent or much less developed in other species. One is the ratchet effect: "faithful social transmission that can work as a ratchet to prevent slippage backward — so that the newly invented artifact or practice preserves its new and improved form at least somewhat faithfully until a further modification or improvement comes along" (Tomasello 1999:5). While many non-human primates are capable of making innovations, they appear to lack the cognitive abilities requisite to copying them (Kummer & Goodall 1985).

A second critical component of human cultural transmission is intentional reasoning: the understanding that things that behave (e.g., human and non-human animals) have goals, and that these goals influence their behavior (Baron-Cohen 1995; Barrett 2005; Dennett 1987). This ability enables us to explain the behavior of others in terms of the goal it is directed toward. This in turn enables us to visualize how a person might use a given artifact — to "understand the intentional significance of the tool use or symbolic practice" (Tomasello 1999:6).

Yet another critical component of human cultural transmission is what Tomasello refers to as "joint attention" (1999). Late in the first year of life, infants develop the ability to look where an adult is pointing (gaze following), check to see if the adult is looking at the same object they are looking at (checking attention), act on objects in

the same way adults are acting on them (imitative learning), and direct adult attention to objects by pointing at or holding up an object. In a study involving 24 children, these components emerged in most cases between nine and twelve months, and in distinct order: 20 out of 24 infants first mastered tasks that required sharing or checking adult attention, then mastered tasks that required following an adult's gaze, and then mastered tasks that required directing adult attention to an object (Carpenter, Nagell & Tomasello 1998).

Given, then, that humans are designed to acquire certain kinds of information from conspecifics, an important question follows: What kinds of information are humans designed to acquire from conspecifics? This paper provides a partial answer to that question. As Tooby and Cosmides (1990, 2001) explain, the mind contains mechanisms — known as *motivational systems* — designed to guide attention to environmental stimuli that recurrently impacted fitness. For example, one way the mind guides behavior is by causing us to experience pleasure when we do something that increases our chances of surviving or reproducing (e.g., eating, sleeping, sex). Aesthetic preferences are another example: we find a given object, activity, or phenomenon attractive because it exhibits cues that, in ancestral environments, signaled that it would be advantageous to pay attention to it. In short, the mind is designed to notice and input information that, in ancestral environments, tended to increase the individual's chances of surviving and/or reproducing.

Motivational and attentional systems cast folklore themes in a new light. For tens of thousands of years, narrative has been oral (Scalise Sugiyama 2001). This means that over the course of the development of the narrative faculty, story content was constrained by the limitations of memory — specifically, by the kinds of information human memory is designed to input and store. In effect, oral traditions are maps of information regions that were instrumental to survival and/or reproduction in ancestral environments. Two conclusions follow: (1) the themes that recur cross-culturally in oral traditions correspond to domains of information that the mind is designed to attend to, input, and store; and (2) the information contained in oral traditions increased our ancestors' chances of surviving and/or reproducing.

This paper deals with one of those themes — the trickster — and the information domain to which it corresponds — deceit in social relations. Specifically, I argue that the universality of the trickster theme is one line of evidence in support of the hypothesis that humans have evolved mechanisms dedicated to social exchange. The facet of this problem addressed by oral narrative is information storage — specifically, storage of information relevant to effecting, detecting, preventing, thwarting, and/or punishing deceit. The trickster genre

contains a multitude of free-rider scenarios: possible goals, possible tricks used to attain those goals, and the consequences of those tricks for the victim, the trickster, or both. The remainder of this paper will explore various components the free rider problem, and how trickster tales model them.

Adaptations for Group Living: Social Exchange

Evidence that humans have evolved an integrated collection of cognitive mechanisms dedicated to navigating their social world has been steadily accumulating over the last two decades. Perhaps the best known of these posited mechanisms is the theory of mind module (ToMM), which emerges predictably around age four-and-a-half (the absence of ToMM is diagnostic of autism; see Baron-Cohen 1995; Baron-Cohen et al. 1985; Frith 1989; Leslie 1991, 1994). “Theory of mind” refers to the ability to understand that other people have thoughts and beliefs (“mental representations”), which in turn enables us to intuit and predict the beliefs of others. Theory of mind also enables us to lie — that is, to understand that two people can have different beliefs about the same object. Obviously, this ability is integral to the practice of deceit in social relations.

A fundamental problem of group living is conflict of interest. Group living inevitably entails competition for access to resources (e.g. food, water, mates). Resources are finite, a situation exacerbated by the fact that each individual would like to monopolize the best of those resources — for example, the ripest and most prolific berry patch, the most productive and reliable fishing hole, the most fertile and fit mate. These conditions favor bullying, whereby the biggest or most formidable individual gets the choicest goods by intimidating others. However, the meek are not without recourse: individuals can form alliances to defend themselves against the predations of other group members.

This is where reasoning about social exchange enters the picture. An alliance is a social contract, the terms of which are “I’ll help you if you help me.” In other words, one individual does a favor for another with the understanding that the favor will be reciprocated at some undetermined time in the future. As noted above, there is always a chance that the recipient of the favor will not reciprocate: this is known as the “free rider” problem. In order for cooperation to be evolutionarily stable within a population, the free rider problem must be solved. To this end, several conditions must be met: individuals must (1) encounter the same individuals repeatedly, (2) recognize individuals they have met before, (3) remember whether an individual has reciprocated them or not; and (4) prevent cheaters from taking a benefit without paying the cost or exclude cheaters from future

exchange interactions (Axelrod 1984; Axelrod & Hamilton 1981). In other words, individuals must be able to detect and punish cheaters.

Over the last twenty-five years, through an exhaustive series of experiments, Cosmides and Tooby and their associates have amassed a compelling array of evidence that the human mind contains algorithms for guiding reasoning about social contracts (for a review, see Cosmides & Tooby 2005). Many of these experiments utilize the Wason-selection task, in which subjects are asked to identify violations of the conditional rule, "If P, then Q." When the content of the rule is abstract or descriptive (e.g., "If a person eats hot chili peppers, then he will drink a cold beer"), only 5-30% of subjects respond correctly. However, when the rule is expressed as a social contract (e.g., "If you give me your watch, I'll give you \$20"), 65-80% of subjects give the correct response, *P* and *not-Q* (Cosmides & Tooby 1992). Replication of these results among Amazonian foragers indicates that this reasoning capacity is universal and not the result of cultural processes (Sugiyama et al. 2002). Administration of the Wason-selection task to a patient with bilateral limbic system damage supports this conclusion (Stone et al. 2002). The patient, R.M., was given two types of reasoning problems that take the form "If P, then Q": social contract rules ("If you take the benefit, then you must pay the cost") and precaution rules ("If you engage in hazardous activity X, then you must take precaution Y"). R.M. performed significantly worse on social contract reasoning than on precaution reasoning, which suggests that the human capacity for reasoning about social exchange can be impaired, and thus that it is a specialized cognitive mechanism distinct from other kinds of social reasoning mechanisms (Stone et al. 2002). A study of schizophrenic patients supports the hypothesis that the faculty for reasoning about cheaters is separate from other reasoning faculties: whereas patients' general logical reasoning abilities were impaired, their cheater-detection abilities were not (Maljkovic 1987).

Merely detecting free riding, however, is not sufficient to prevent it. Tellingly, evidence from experimental economics shows that humans are willing to incur costs to punish free riders (Dawes, Orbell & Van de Kragt 1986; Fehr & Gachter 2000; Ostrom, Waler & Gardner 1992; Sato 1987; Yamagishi 1992), and that overall levels of cooperation increase when the likelihood that free riding will be punished is sufficiently high (Fehr & Gachter 2000; Kurzban, McCabe, Smith & Wilson 2001). Punitive sentiments toward cheaters are posited to be the product of a motivational subsystem dedicated to preventing "free rider designs from having higher fitness than cooperator designs" (Price, Cosmides & Tooby 2002:228). This hypothesis is supported by survey data, which show that willingness to participate in a collective action is a strong predictor of punitive sentiment toward free riders (Price, Cosmides & Tooby 2002).

As noted in the previous section, adaptations for reasoning about social exchange can only address facets of the free rider problem that recur across time and cultures; they cannot anticipate particular stratagems that might be used, and they cannot prevent cheating. In the next section, we will see how narrative provides a means of surmounting these obstacles.

Trickster Stories as Cognitive Models of the Free Rider Problem

The trickster character appears cross-culturally in a variety of forms (Bierhorst 1985; Radin 1956). The trickster is sometimes a human being, sometimes an animal but, as Stith Thompson observes, the "distinction is never very clear," and in "the most human of these tales ... the animal nature of the trickster seems always in the background of the narrative" (1929/1966: xviii). Some of the better-known tricksters are Anansi, Brer Rabbit, Coyote, Reynard the Fox, leprechauns, and fairy folk, but there are many others. In North America alone, for example, there are coyote, mink, blue jay, spider, beaver, porcupine, turtle, moose, and rabbit tricksters (Bierhorst 1985; Erdoes & Ortiz 1998; Norman 1999; Rasmussen 1930; Radin 1956; Thompson 1929/1966). When it comes to cheating, the trickster is a violator of many rules, not just of social contracts; consequently, trickster tales contain information about many different kinds of deceit in social relations. Free riding is a decided part of this repertoire, and is the focus of this discussion. It should be noted that, in the context of social exchange, the terms "free riding" and "cheating" refer to taking a benefit without paying a cost, or accepting a favor without reciprocating.

Indigenous storytellers, folklorists, and anthropologists commonly observe that trickster and other traditional tales function, in part, to delimit behavioral boundaries by providing examples of appropriate and inappropriate behavior and their consequences. Barre Toelken (1997), for example, asked a Navajo storyteller why Coyote stories are told. The response was, "If my children hear the stories, they will grow up to be good people; if they don't hear them, they will turn out to be bad" (101-102). One of Morris Opler's informants compared Jicarilla mythology to a Testament, an observation which Opler seconded: "Jicarilla mythology is truly the codification of the beliefs and mores of the group. There are few matters of conduct which the Jicarilla do not refer back to this body of lore. It is thought of as the proper guide to action, positive and negative" (1938: viii). Grenville Goodwin makes a similar observation, noting that among White Mountain Apache, Coyote tales in particular often have a moral, and that "parents or grandparents after telling these to children, often

gave a short lecture to the youngsters: ‘Don’t do like Coyote did in the story. He did a lot of bad things for us long ago such as marrying his daughter and stealing!’’ (1939:ix). Brian Street argues that trickster tales “can be seen as moral examples re-affirming the rules of society; or rather they serve as a model for these rules, demonstrating what happens if the prescriptions laid down by society are not observed” (1972:85).

In cognitive terms, these “guides,” “examples,” and “morals” are cause-and-effect models of the human social world that can be used to predict which courses of action will lead to which results. In the case of trickster tales, these models address such questions as, In what ways might other people try to cheat me? What might happen to me if I try to cheat someone? Is it ever acceptable to cheat and, if so, when? The different schemes and scenarios presented in trickster tales enable the listener to “observe” a wide variety of stratagems and a wide variety of responses to free riding (both the characters’ and the audience’s), thereby learning what behavior is allowed in their society and what behavior is not.

Trickster tales contain two broad classes of information relevant to the free rider problem: ways of cheating and consequences of cheating. As noted above, solution of the free rider problem requires four conditions: (1) regularly encountering the same individuals, (2) recognizing individuals, (3) remembering whether a given individual has reciprocated, and (4) punishing non-reciprocators. The stratagems used by tricksters typically foil one or more of the mechanisms that evolved to enable these conditions. Thus, trickster tales contain information that is useful for recognizing a potential scam (or for planning one) and/or for discouraging would-be cheaters (or for avoiding punishment).

An example of the former is the Cree tale, “Trickster and the Shut-Eye Dancers” (Norman 1999). In this story, Trickster and Fox finally manage to catch three ducks after more than twenty-four hours of effort. Fox wants to eat them immediately, but Trickster says they will taste better with some other-side-of-the-marsh grass sprinkled on them. While Fox travels across the marsh to get the grass, Trickster roasts the ducks and eats them all. The implied contract in this scenario is, “If you help me catch ducks, I will share them with you.” The obvious lesson of the story is to avoid giving your partner the opportunity to break his/her word. (From the perspective of a free rider, the story presents information regarding a ruse that might be employed to trick someone out of food.) Fox creates this opportunity by leaving the ducks with Trickster and going to the other side of the marsh.

One of the troublesome facts folklorists have wrestled with over the years is that many tricksters are also culture heroes. As Thompson notes, the trickster may simultaneously be the bringer "of culture and light to his people" and be "the incarnation of greediness, lust, cruelty, and stupidity" (1929/1966: xviii). An information-transmission perspective easily resolves this paradox. Cheating can be good or bad, depending on context and perspective. For example, a trick that enables one to acquire an indispensable and otherwise unattainable resource or to weaken an aggressive and formidable enemy can be a very useful tool. Accordingly, trickster tales implicitly delineate a culture's tacit rules regarding when and whom it is acceptable to cheat. Generally speaking, cheating enemies or out-group members is condoned, and cheating in-group members (family, friends, band members) is not.

For example, in Mandan-Hidatsa culture, Coyote's "traits are found desirable to the Indian in their conflict with enemy tribes and with the antagonistic forces of nature ... he is sly and tricky, a good thief, capable of providing for himself when provisions fail" (Beckwith 1938: xvii). Similarly, when a story is told among the Skidi Pawnee "in which Coyote, or some culture-hero overcomes his enemy, the teller thereby indicates his desire that he also may be equally successful in some venture which he has in hand" (Dorsey 1904: xxii). The Salishan tell a story that exhibits a similar attitude, wherein Coyote steals fire for the people. Coyote recruits the help of good runners, such as Fox, Wolf, and Antelope, and travels to the home of the Fire people, where he announces that they have come to dance, play, and gamble. The Fire people make preparations for a dance, and Coyote makes himself a headdress out of pitchy yellow-pine shavings and dry cedar bark. They then begin to dance around the low fire, and Coyote complains that he can't see so that they will make it bigger. He keeps this up until eventually the fire is blazing, at which point he

danced about wildly until his head-dress took fire. He pretended to be afraid, and requested the Fire people to put it out. They warned him not to dance so close to the fire. When near the door, he swung the long fringes of his head-dress across the fire, and ran out. The Fire people pursued him. He gave his head-band to Antelope, who ran and passed it on to the next runner. Thus they carried it in relays. The Fire people caught up with the animals, and killed them one by one (Teit 1917:2).

Coyote escapes and puts fire into the trees and grass, after which the people can use them to make fire.

One might ask what practical information about cheating is presented in this story, given that people have no need to steal fire, and could not use other animals as accessories if they did. Although the plot may be pure fantasy, the social behavior depicted in the story is very true-to-life. For example, Coyote exploits Salishan etiquette in order to advance his scheme (by announcing that the purpose of his visit is to dance, and by insisting that his hosts make the fire bigger). The story also illustrates a use of pretense: Coyote feigns fear when his headdress catches on fire, prompting the Fire people's advice that he back away from the fire, which gives Coyote a pretense for moving toward the door, running in "panic," and making his escape.

The Inuit tale of "Kasiagsak, The Great Liar" (Rink 1875/1997) identifies conditions under which cheating is not acceptable. Kasiagsak is an incompetent hunter who attempts to mask his deficiency with his pathological lying. In one instance, he visits his father-in-law in another village and finds that the household is starving. Kasiagsak boasts that his storehouses are full of food, and offers to bring them provisions from his village. He invites his little brother-in-law to accompany him, but when they get to Kasiagsak's home, there is nothing to eat but one raven. The boy has "to look to the other people for some food; and at his departure the next day, he likewise received all his presents from them, and not from Kasiagsak" (Rink 1875/1997:296). Another time, Kasiagsak hears that a couple in a nearby village has just lost a baby and goes to visit. When he finds out what the dead child's name was, he announces that he has a baby daughter by the same name, which of course is a lie. According to custom, the mourners hold a feast for Kasiagsak and give him gifts to take home to his daughter, which he tells his wife he scavenged from a shipwreck. The next day, the mourners come to Kasiagsak's village to bring him more gifts for his little daughter. When they discover that Kasiagsak does not have any children, they take back all the gifts they have given him. Kasiagsak's end serves as a warning to anyone who would emulate him. One day he finds a piece of whale skin floating on the water, and tells his fellow villagers that he has found a whale carcass. He offers to lead them to it, "but when they had gone a long way from home without seeing anything like a floating whale, they got tired of Kasiagsak, and put a stop to all his fibs by killing him then and there" (Rink 1875/1997:297).

A story may also clarify what constitutes cheating and/or what does not. The Jicarilla Apache tale "Coyote and the Badly Treated Dog," (Opler 1938) is a case in point. In this tale, Coyote helps a neglected dog trick his master into treating him better. Coyote pretends to steal one of the master's chickens, whereupon the dog pretends to chase him. After a bout of pretend fighting, Coyote releases the chicken and pretends to run off. Seeing all this, the master decides that

the dog is useful and resolves to take better care of it. In this case, the implied contract between the farmer and dog is, "If you do something useful for me, I will feed you." The farmer hasn't kept his end of the bargain because, as far as he can see, the dog isn't doing him any service; the dog hasn't kept his end of the bargain because he hasn't had any service to perform (or, as he has grown weak from hunger, he hasn't had the energy to do so). This story makes a fine point about reciprocal altruism: you can't blame a person for not reciprocating your favor if there has as yet been no need or opportunity for him/her to do so. Free riding doesn't occur until the need or opportunity arises for reciprocation and the debtor doesn't reciprocate. This is the case with the badly treated dog: by withholding food, the farmer is treating the dog as if he were a free rider, when in reality he simply hasn't had the opportunity (or energy) to reciprocate.

As noted above, cheating involves manipulating one or more of the conditions that must be met to solve the free rider problem, the first of which is that individuals must encounter each other recurrently. One can't reciprocate a favor if one never sees one's benefactor again. And, conversely, one can't be punished for cheating (i.e., excluded from future exchanges) by a person whom one never sees again. Coyote capitalizes on this fact in a Jicarilla Apache tale in which he shows how he can lie (Opler 1938). In this story, Coyote comes upon a camp and agrees to teach the people there how to lie if they give him a horse, blanket, saddle, and whip. After receiving these goods, Coyote simply gallops away on the horse. (Of course, the beauty of the story is that, in tricking the people, Coyote does — technically — show them how to lie, thereby fulfilling and violating the contract at the same time!)

The second condition that must be met for solution of the free rider problem is that individuals must be able to distinguish one conspecific from another. Without such a mechanism, it would be impossible to keep track of who has reciprocated a favor and who has not. One way a free rider can thwart this system is by using disguise or by otherwise pretending to be someone he/she is not. Tellingly, the trickster is often a shape shifter (Hynes 1993). In a Karok story, for example, Coyote is floating down river and sees some girls on shore hooking out driftwood. He transforms himself into a piece of driftwood so that they will pull him out. His plan almost works — two girls in succession hook him but then throw him back into the water, saying "It might be Coyote" (Kroeber & Gifford 1980:163). Instead of transformation, the trickster may simply use disguise. For example, the Pawnee tell a story in which Coyote conspires with Fox to get some of Cougar's meat. Coyote tells Fox, "I have been to the cougar's tipi, and he has much meat in his tipi, and the only way we can get some of it is for me to strap you on a board, call you my son, take you down from my back and tell him that his baby is hungry, that it is his son"

(Dorsey 1904:266). This scheme takes advantage of the obligation a man customarily has to provide food for his wife and children: as Cougar's "wife," Coyote is owed food. Coyote plans to eat the food that is "owed" him and leave, but the scheme backfires on him because, as Cougar's "wife," Coyote is obligated to sleep with Cougar. Cougar is quite satisfied with the (presumably anal) sex, but Coyote is so humiliated that he leaves Cougar's residence as soon as he can, and even attempts to kill Fox to prevent him from telling others about the misadventure. The story thus serves as a warning to potential free riders: if you cheat others, you'll be punished, just as Coyote gets his in the end.

Of course, in small, face-to-face hunter-gatherer societies it would be hard to fool someone through the use of disguise, but there would certainly be opportunities for a person to pretend to be someone else. Band membership is very fluid, with individuals and families frequently leaving one group to visit kin and friends in another. Visiting is a chief means by which foragers cope with resource scarcity: when food or water begins to give out in their territory, they visit family or friends in another camp, in hope that resources will be more abundant there. The sense of obligation between hosts and guests is very strong, and is frequently extended to friends-of-friends. For example, I could show up in your camp claiming to be a maternal cousin of your paternal cousin Vinnie, and you would be obligated to welcome me into your camp, even though no one in your camp — including you — has ever met me. It is easy to see how such a system might be exploited.

A third weapon against free riding is a tally-keeping mechanism, whereby individuals are able to track whom they have done favors for, whom they have accepted favors from, and whether or not those favors have been reciprocated. As with the others, however, this mechanism can be foiled. In a story told by the Pawnee, for example, Coyote is starving and desperately searching for food when he sees seven buffalo approaching. He immediately thinks, "Now, what can I do to these buffalo, so that they will give me something to eat?" (Dorsey 1904). He begins singing a song in which he relates how he saved the buffalo from being ambushed:

You buffalo, you had a narrow escape; The people were about to surround you. I ran right among them, Took my knife out, Cut their bow-strings, Went among those who had guns, Broke the flints so that they could not shoot. The people, not being able to shoot returned home (Dorsey 1904:263).

Coyote further warns them not to travel east, because there is a big village there. Hearing this, the buffalo think, "Why, we should have been killed if it had not been for that fellow there" (Dorsey 1904:263), and they give Coyote meat in gratitude. In reality, there is no village, and there was no ambush attempt. Coyote has managed to get himself reciprocated by manipulating the buffalos' favor-tallying mechanism — that is, by making them think he has done them a great favor when, of course, he hasn't done anything for them at all.

A fourth defense against free riding is punishment: cheaters can be excluded from future exchanges. Of course, it is better never to be cheated at all, and one way to discourage others from trying to trick you is to warn them what will happen to them if they do. Trickster tales are one way of doing this: in many tales, the trickster is punished or otherwise suffers as a result of his/her trickery. The Yanomamö, for example, tell a story about a stingy mother-in-law who cheats her son-in-law out of food. The latter gathers *wapu* fruits and puts them in the river to soak (*wapu* fruits are hard and bitter and must be soaked in water to make them palatable). A few days later, when the man asks his mother-in-law if the fruits are ready to eat, she lies and says they need more soaking. In reality, she wants them all for herself and has been eating them on the sly. When the son-in-law catches her, he throws a sharp rock at her, at which point she turns into an agouti (an animal known by the Yanomamö for its gluttony) and runs off into the jungle. In real life, of course, free riders cannot be transformed into animals, but the point is made: cheaters may be attacked or banished from the group.

The Inuit make this point even more vividly. In "The Blind Man Who Regained His Sight," a mother takes advantage of her son's blindness to cheat him out of the meat he has killed. The youth has his mother aim his bow for him at a bear that is thrusting its head through the window of their hut. He shoots and kills the bear, but his mother tells him that he has missed because she doesn't want to share the meat with him. His sister tells him that he has indeed killed the bear, and slips him meat when their mother isn't looking. One day, the young man asks his sister to guide him to a lake, where he encounters a loon. In marked contrast to the mother's behavior, the son makes and keeps a contract with the animal: "Give me back my sight, and I will give you my knife in payment" (Rasmussen 1921:108). His sight restored, the youth decides to go seal hunting, using his mother as a harpoon float. When he harpoons a whale, she is dragged out to sea and drowned.

One might argue that the universality of the trickster theme is a by-product of our evolved interest in such behavior — that the same motivational mechanisms that cause us to pay attention to cheaters and cheating incidentally cause us to share information about cheaters and cheating. However, if humans are designed to exchange a wide variety

of information in highly complex ways (and mounting evidence indicates that we are), it follows that at least some of the means by which we store and transmit information are designed as well. Studies of learning in non-human animals suggest that this design includes constraints on information acquisition: specifically, that we are designed to store and transmit some kinds of information and not others (Byrne 1995; Hauser 2000). Cross-cultural themes in oral traditions offer clues to the kinds of information the mind is designed to input socially.

Free-riding stratagems and the consequences of cheating are by no means the only kinds of social information communicated via narrative. Oral traditions contain information relevant to a wide range of selection pressures exerted by group living, including mating, parenting, kin relations, coalitions, and aggression. These themes are well-documented in folklore motif indexes (e.g., Aarne 1961; Thompson 1957). As with trickster tales, stories that address other social situations augment the body of experiences that the listener may reference, thus improving his/her ability to predict and manipulate the behavior of others.

In ancestral environments, where language and storytelling originally developed, there were no books or archives or databases. The only place to store valuable information was in the memories of individuals. The folklore of preliterate, small-scale societies is thus a record of the information our foraging ancestors needed in order to survive — information relevant not only to navigating the social world (Scalise Sugiyama 1996), but to foraging (Scalise Sugiyama 2001), predator avoidance (Scalise Sugiyama 2006), wayfinding (Scalise Sugiyama, under review), and warfare (Scalise Sugiyama, in preparation). As John Bierhorst writes, myths “are inherited from the past” (19851). We should take care not to squander our legacy.

Works Cited

- Aarne, Antti. 1961. *The Types of the Folktale: A Classification and Bibliography*. Trans. Stith Thompson. 2nd revision. Helsinki: Suomalainen Tiedeakatemia, Academia Scientiarum Fennica.
- Alexander, Richard. 1989. Evolution of the human psyche. In *The Human Revolution: Behavioral and Biological Perspectives on the Origins of Modern Humans*. P. Mellars and C. Stringer, eds. Princeton: Princeton University Press: 455-513.
- Axelrod, R. 1984. *The evolution of cooperation*. New York: Basic Books.
- Axelrod, R. and W. D. Hamilton. 1981. The evolution of cooperation. *Science* 211:1390-96
- Baron-Cohen, Simon. 1995. *Mindblindness: An essay on autism and theory of mind*. Cambridge: MIT Press.

- Baron-Cohen, Simon, Alan Leslie, and U. Firth. 1985. Does the autistic child have a theory of mind? *Cognition* 21:37-46.
- Barrett, Clark. 2005. Cognitive development and the understanding of animal behavior. In *Origins of the Social Mind* B. Ellis and D. Bjorklund (eds.). New York: The Guilford Press. 438-467.
- Beckwith, Martha Warren. 1938. *Mandan-Hidatsa Myths and Ceremonies. Memoirs of the American Folk-Lore Society*, vol. XXXII. New York. American Folk-Lore Society.
- Bierhorst, John. 1985. *The Mythology of North America*. New York: William Morrow and Company.
- Byrne, Richard. 1995. *The Thinking Ape*. Oxford: Oxford UP.
- Byrne, Richard and Andrew Whiten (eds.). 1988. *Machiavellian Intelligence. Social Expertise and the Evolution of Intellect in Monkeys, Apes, and Humans*. Oxford: Clarendon.
- Carpenter, M., K. Nagell, and M. Tomasello. 1998. Social cognition, joint attention, and communicative competence from 9 to 15 months of age. *Monographs of the Society for Research in Child Development* 63.
- Cashdan, Elizabeth. 1983. Territoriality among human foragers: Ecological models and an application to four Bushman groups. *Current Anthropology* 24:47-66.
- Chagnon, Napoleon. 1997. Yanomamö. 5th ed. New York: Harcourt.
- Cosmides, Leda. 1985. Deduction or Darwinian algorithms? An explanation of the "elusive" content effect on the Wason selection task. Doctoral dissertation, Harvard University.
- Cosmides, Leda and John Tooby. 1992. "Cognitive Adaptations for Social Exchange." In *The Adapted Mind*. Jerome H. Barkow, Leda Cosmides, and John Tooby, eds. Pp. 163-228. New York: Oxford University Press.
- . 2005. Neurocognitive adaptations designed for social exchange. *Handbook of evolutionary psychology*. David Buss, ed. Pp. 584-627. Hoboken, NJ. John Wiley and Sons.
- Dawes, R.M., J.M. Orbell, and J.C. Van de Kragt. 1986. Organizing Groups for Collective Action. *American Political Science Review* 80:1171-1185.
- Dennett, Daniel. 1987. *The Intentional Stance*. Cambridge, MA: MIT Press.
- Dorsey, George. 1904. *Traditions of the Skidi Pawnee. Memoirs of the American Folklore Society*. Vol. VIII. Boston: Houghton, Mifflin and Company.
- Downs, James. 1966. *The Two Worlds of the Washo: An Indian Tribe of California and Nevada*. New York: Holt, Rinehart, and Winston.
- Erdoes, Richard and Alfonso Ortiz. 1998. *American Indian Trickster Tales*. New York: Viking.
- Fehr, E. and S. Gächter. 2000. Cooperation and Punishment in Public Goods Experiments. *American Economic Review* 90:980-994.
- Flinn, Mark, David Geary, and Carol Ward. 2005. Ecological Dominance, Social Competition, and Coalitional Arms Races: Why Humans Evolved Extraordinary Intelligence. *Evolution and Human Behavior* 26:10-46.
- Fox, Robin. 1995. Sexual conflicts in the epics. *Human Nature* 6(2):135-144.

- Frith, U. 1989. *Autism: Explaining the enigma*. Oxford: Basil Blackwell.
- Goodwin, G. (1939). *Myths and Tales of the White Mountain Apache. Memoirs of the American Folk-Lore Society*. Vol. XXXIII. New York: J. J. Augustin.
- Groot, A. D. de. 1966. Perception and memory versus thinking. In *Problem Solving*. B. Kleinmuntz, ed. New York: Wiley.
- Hauser, Mark. 2000. *Animal Minds. What Animals Really Think*. New York: Henry Holt and Company.
- Humphrey, Nicholas. 1983. *Consciousness Regained*. Oxford: Oxford University Press.
- . 1988. The Social Function of Intellect. In *Machiavellian Intelligence Social Expertise and the Evolution of Intellect in Monkeys, Apes, and Humans*. Richard Byrne and Andrew Whiten, eds. Pp. 13-26. Oxford: Oxford UP.
- Hynes, William. 1993. Mapping the characteristics of mythic tricksters: A heuristic guide. In *Mythical Trickster Figures: Contours, Contexts, and Criticisms*. W. Hynes and W. Doty (eds.). Tuscaloosa: University of Alabama Press: 33-45.
- Isaac, Glynn. 1978. The food-sharing behavior of protohuman hominids. *Scientific American* 238:90-108.
- Kelly, R. L. 1995. *The Foraging Spectrum*. Washington, D.C.: Smithsonian Institution Press.
- Kroeber, A. L. and E. W. Gifford. 1980. *Karok Myths*. Grace Buzaljko (ed.). Berkeley: University of California Press.
- Kummer, H. and J. Goodall. 1985. Conditions of innovative behaviour in primates. *Philosophical Transactions of the Royal Society of London B308*: 203-214.
- Kurzban, R., K. McCabe, V. Smith and B. Wilson. 2001. Incremental Commitment in a Real-Time Public Goods Game. *Personality and Social Psychology Bulletin* 27(12):1662-1673.
- LeBlanc, Steven and Katherine Register. 2003. *Constant Battles: Why We Fight*. New York: St. Martin's Press.
- Lee, Richard. 1984. *The Dobe !Kung*. New York: Holt, Rinehart and Winston.
- Lee, Richard and Irven DeVore. 1968. *Man the Hunter*. Chicago: Aldine.
- Leslie, Alan. 1991. The theory of mind impairment in autism: Evidence for a modular mechanism of development? In *Natural theories of mind: Evolution, development and simulation of everyday mindreading*, edited by Andrew Whiten, 63-78. Oxford: Blackwell.
- . 1994. ToMM, ToBy, and agency: Core architecture and domain specificity. In *Mapping the Mind: Domain Specificity in Cognition and Culture*. L. Hirschfeld and S. Gelman (eds.). Cambridge: Cambridge University Press. 119-148.
- Lowie, Robert H. *Myths and Traditions of the Crow Indians. Anthropological Papers of the American Museum of Natural History*. Vol. XXV, Part I.
- Malijkovic, V. 1987. Reasoning in evolutionarily important domains and schizophrenia: Dissociation between content-dependent and content independent reasoning. Unpublished honors thesis, Department of Psychology, Harvard University.
- Norman, Howard. 1999. *Trickster and the Fainting Birds*. San Diego: Gulliver Books, Harcourt Brace.

- Opler, Morris. 1938. *Myths and Tales of the Jicarilla Apache Indians. Memoirs of the American Folklore Society.* Vol. XXXI. New York: American Folk-Lore Society.
- Ostrom, E., J. Walker, and R. Gardner. 1992. Covenants with and without a Sword: Self-Governance in Possible. *American Political Science Review* 86:404-417.
- Pinker, Steven. 1997. *How the Mind Works.* New York: W. W. Norton.
- Price, Michael, Leda Cosmides, and John Tooby. 2002. Punitive sentiment as an anti-free rider psychological device. *Evolution and human behavior* 23:203-231.
- Radin, Paul. 1956. *The Trickster: A Study in American Indian Mythology.* Westport, CT: Greenwood Press.
- Rasmussen, Knud. 1930. *Observations on the Intellectual Culture of the Caribou Eskimos. Report of the 5th Thule Expedition 1921-24*, vol. VII, no. 2. Copenhagen: Gyldendalske Boghandel, Nordisk Forlag.
- . 1931. *The Netsilik Eskimos: Social Life and Spiritual Culture. Report of the 5th Thule Expedition 1921-24*, vol. VIII, no. 1-2. Copenhagen: Gyldendalske Boghandel, Nordisk Forlag.
- Rink, Hinrich. 1875/1997. *Tales and Traditions of the Eskimo.* Mineola, NY: Dover Publications.
- Sato, K. 1987. Distribution of the Cost of Maintaining Common Resources. *Journal of Experimental Social Psychology* 23:19-31.
- Scalise Sugiyama, Michelle. 1993. Folklore and the adapted mind. Paper presented at the annual meetings of the Human Behavior and Evolution Society, Binghamton, New York, August.
- . 1996. On the origins of narrative: Storyteller bias as a fitness-enhancing strategy. *Human Nature* 7(7): 403-425.
- . 2001. Food, foragers, and folklore: The role of narrative in human subsistence. *Evolution and Human Behavior* 22(4):221-240.
- . 2005. Reverse-engineering narrative: Evidence of special design. In *The Literary Animal*. J. Gottshall & D. S. Wilson, eds. Pp. 177-196. Chicago: Northwestern University Press.
- . 2006. Lions and tigers and bears: Predators as a folklore universal." In *Anthropology and Social History: Heuristics in the Study of Literature*. H. Friedrich, F. Jannidis, U. Klein, K. Mellmann, S. Metzger, and M. Willems, eds. Paderborn: Mentis. 319-331.
- . "Humanizing the landscape: Storytelling as cognitive mapping." Under review by *American Anthropologist*.
- . "The oral tradition as a verbal artifact: Using folklore to reconstruct methods and tactics used in prehistoric warfare." In preparation for *Warfare in Human Evolution: An Interdisciplinary Perspective*. Doug Kennett, Michelle Scalise Sugiyama, Lawrence Sugiyama, and Frances White, eds.
- Stone, V., L. Cosmides, J. Tooby, N. Kroll, and R. Knight. 2002. Selective impairment of reasoning about social exchange in a patient with bilateral limbic system damage. *PNAS* 99 (17):11531-11536.
- Street, Brian. 1972. The trickster theme: Winnebago and Azande. In *Zande Themes: Essays Presented to Sir Edward Evans Pritchard*. A. Singer and B. Street (eds.), Totowa: Rowman and Littlefield: 82-104.

- Sugiyama, Lawrence and Richard Chacon. 2000. Effects of illness and injury on foraging among the Yora and Shiwiar: Pathology risk as adaptive problem. In *Human Behavior and Adaptation: An Anthropological Perspective*. L. Cronk, N. Chagnon, & W. Irons (eds.). New York: Aldine: 371-395.
- Sugiyama, Lawrence, John Tooby, and Leda Cosmides. 2002. Cross-cultural evidence of cognitive adaptations for social exchange among the Shiwiar of Ecuadorian Amazonia. *Proceedings of the National Academy of Sciences* 99(17):11537-11542.
- Teit, James A. 1917. *Folk-tales of Salishan and Sahaptin Tribes*. Lancaster, PA: American Folk-lore Society.
- Thompson, Stith. 1929/1966. *Tales of the North American Indians*. Bloomington: Indiana University Press.
- . 1957. *Motif Index of Folk Literature*. Vol. IV. Bloomington: Indiana University Press.
- Toelken, Barre. 1997. Poetic retranslation and the 'Pretty Languages' of Yellowmen. In *Traditional Literatures of the American Indian* 2nd ed. Karl Kroeber (ed.). Lincoln: University of Nebraska Press.
- Tomasello, Michael. 1999. *The cultural origins of human cognition*. Cambridge, MA: Harvard University Press.
- Tonkinson, Robert. 1978. *The Mardudjara Aborigines: Living the Dream in Australia's Desert*. New York: Holt, Rinehart and Winston.
- Tooby, John and Leda Cosmides. 1990. The past explains the present. Emotional adaptations and the structure of ancestral environments. *Ethology and Sociobiology* 11: 375-424.
- Tooby, John and Irven DeVore. 1987. The reconstruction of hominid behavioral evolution through strategic modeling. In *The Evolution of Human Behavior: Primate Models*. W. Kinsey (ed.). Albany: SUNY Press. 183-237.
- Turnbull, Colin. 1983. *The Mbuti Pygmies: Change and Adaptation*. New York: Holt, Rinehart, and Winston.
- Whiten, Andrew and Richard Byrne. 1997. *Machiavellian Intelligence II: Extensions and Evaluations*. Cambridge: Cambridge University Press.
- Wiessner, Polly. 1982. Risk, reciprocity and social influences on !Kung San economics. In *Politics and History in Band Societies*. E. Leacock and R. B. Lee (eds.). Pp. 61-84. Cambridge: Cambridge University Press.
- Wilbert, Johannes and Karin Simoneau. 1992. *Folk Literature of the Yanomami Indians*. Los Angeles: UCLA Latin American Center Publications.
- Yamagishi, T. 1992. Group Size and the Provision of a Sanctioning System in a Social Dilemma. In *Social Dilemmas: Theoretical Issues and Research Findings*. W. Liebrand, D. Messick, and H. Wilke, eds. Pp. 267-287. Oxford: Permagon.

To Discover, an Intransitive Verb: Christopher Columbus's First Encounter with the American Landscape

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Although the Admiral's main objective was not to write, and certainly not to write literature, it is with the verb *to write* that Columbus refers in the *Journal* to his expedition. "[...] I thought of writing on this whole voyage, all that I would do and see and experience [...]" (Dunn and Kelley 19-21). The Admiral needs to write this journey, for the journey cannot be justified without the writing. And the writing is there to make up for the absence of the Sovereigns of Spain who have funded the journey. Isabella and Fernando need to be convinced that their money was well spent. The act of writing in the *Journal* is therefore tied to an effort to gain and also share knowledge and understanding of what lay beyond the rim of the horizon, to unveil the Ocean's secret, ultimately an unrecognizable object, the American natural environment.

And the effort was double. On the one hand, there were the trees so *very* green, there were the plants, and there was the vegetation that the Admiral did not recognize; on the other, there was the task of communicating the scenery to the Spanish sovereigns, who had not yet seen the object. This attempt *to write* the American landscape makes Columbus one of the earliest, if not the earliest American naturalist. Now the question is: With what cognitive baggage did Columbus interpret this very green world? He had read Pliny, as well as Marco Polo, but the conceivability of scarcity and the notion of change, of fragility, of first growth, of erosion, and of pollution did not yet belong to his world. Should it therefore be taken for granted that for Columbus this abundance before him would always be there, that the water would always be clean and clear and the trees so *very* green? Antonello Gerbi believes that the historians of antiquity and the early naturalists of America had no concept of evolution. "[...] they believed in the fixity of the species, nature as immobility, or as variety fully unfolded in space, unmarked by the silent and unending march of time" (3).

If there is no concept of evolution, then there is no notion of an endangered world. It is with this conditional phrase in mind that I choose to approach the *Journal* of the first voyage.