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## **Evolution and the Kantian Worldview**

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Professor Brandom ends his essay with a lovely poetic image: the sea is the “great grey mother of us all.” The kernel of literal truth in this metaphor was recognized by Charles Darwin. He drew the conclusion that “... differences in mind between man and the higher animals, great as it is, is certainly one of degree and not of kind” (Darwin 1871: 128). Human minds and brains evolved from non-human minds and brains by building new systems on top of old, or recruiting old systems to new uses. The evolutionary continuity between humans and non-humans entails that many, and probably most, of our psychological capacities are shared in some form by non-human animals. Our uniqueness arises primarily from the particular cluster of social-cognitive capacities we have, not from any radically new materials or organs. One of the great strengths of the account of representation, intentionality, and conceptual content that Brandom sees in the work of Kant and Hegel is that it does not require minded beings to have a special ontological status. The capacity for representation arises from a set of capacities to act in response to events in the social and physical environment. *Prima facie*, the Kant/Hegel/Brandom account of representation is quite friendly to a Darwinian perspective. However, the way Brandom spells out the lessons from Kant and Hegel in this essay seems to entail a radical discontinuity. Only sapient humans who can occupy

normative statuses can truly have concepts and representations. Animals are merely sentient. Are the Kantian lessons, as Brandom has developed them, consistent with what we know about evolution?

Let us begin with a review of the Kantian lessons. Five points are of particular interest to our inquiry.

Lesson 1: The normative characterization of the mental. "...minded creatures are to be distinguished from un-minded ones not by a matter-of-fact ontological distinction (the presence of mind-stuff), but by a normative *deontological* one" (8/1/05 draft, p. 10). Minded creatures are able to make judgments, and to make a judgment is to bind oneself to a conceptual norm. The characterization is normative in the sense that making judgments or endorsing claims are actions subject to assessment. A being that can make a judgment can be held responsible for its consequences.

Lesson 2: The semantic primacy of the propositional. "Concepts and their contents are to be understood only in terms of the contribution they make to judgments: concepts are functions of judgment" (8/1/05 draft, p. 12).

Lesson 3: The pragmatic primacy of force over content. The content of a judgment, what is judged, is determined by what one is responsible for when judging, when endorsing that content.

Brandom uses lessons (1), (2), and (3) to build a story about representational content. The content of a representation is the difference it makes to one's inferential power. To endorse a claim (make a judgment) is to undertake responsibility for both the consequences of the claim and the reasons for it. Hence the relationship between concepts and rules: rules spell out the content of a concept by making explicit what could

count as a reason for judgments containing it and what inferences follow from such judgments. “As *normative* creatures, we are *rational* creatures...in the sense that...we are always liable to normative *assessment* concerning our reasons for doing what we do, or thinking as we do” (8/1/05 draft, pp. 15-16).

The story about content arising from lessons (1), (2), and (3) makes it difficult to see how animals could have concepts or representations of any kind. In *Making it Explicit* (1994: Chapter 3, Section III), Brandom analyzes the status of making an assertion into a complex of interlocking attributions. Other animals apparently do not exhibit such interlocking attributions, hence they do not make assertions. Since assertion is the basic status for evaluating consequences and having reasons, this means that other animals cannot pragmatically endorse propositional contents. Given the primacy of force over content (Lesson 3), this entails that they have no concepts (Lesson 2) and that they have no minds at all (Lesson 1). Something has gone awry. When the mouse runs behind the wainscoting and, seeing it, the cat waits expectantly for it to reappear, we say that she thinks (judges) that the mouse is still hiding there. In such cases, we seem to be attributing some kind of contentful representations to the cat (not to mention the mouse). Denying that the cat has representations drives a wedge between those beings who fully occupy the space of reasons and those who merely inhabit the world of causes. This makes it difficult, if not impossible, to see how the former could have evolved from the latter.

One might think that, in the spirit of an inferential semantics, we could provide the cat's representations with content by looking at the kind of inferences it makes. Lessons (4) and (5) block this move:

Lesson 4: Autonomy is the mark of the normative. "...we are genuinely normatively constrained only by rules we constrain *ourselves* by, that we adopt *as* binding on us. The difference between non-normative *compulsion* and normative *authority* is that we are genuinely normatively responsible only to what we acknowledge as authoritative" (8/1/05 draft, p. 20, emphasis in original).

Lesson 5: Normative force is social. Normative statuses are social statuses instituted by the activity of taking or treating a person as having a particular status. It follows that the content of a judgment is not up to the person who makes it, who undertakes the commitment. The consequences of and appropriate reasons for a judgment are socially articulated by the attitudes of one's fellows.

According to the Kant/Hegel/Brandom account, then, to make an inference is to freely occupy a normative status, and normative statuses are socially instituted. But while they are social in their own way, cat communities do not (and probably could not, given the architecture of cat brains) exhibit the practices required for the normative status of inference-making. The language of freedom and autonomy exacerbates this problem, since animals are paradigmatically not free. Given lesson (1), animals have no minds at all.

The Kantian lessons thus threaten to reintroduce a Cartesian distinction between mindedness and mindlessness. It would not be an ontological distinction; rather, the consequence of the Kantian lessons seems to be that only humans have representations and intensional states. Animals exhibit complex behaviors, but they occupy the world of causes, not the space of reasons. If we admit that animals have minds and there is an evolutionary continuity between their minds and ours, we are faced with a dilemma. We

can either cling to the Kant/Hegel/Brandom conception of normativity and reject Lesson (1), or we can keep the normative conception of the mental and modify the conception of normativity. I submit that the second alternative is the better for two reasons.

First, I agree with Brandom that *the* fundamental lesson is Kant's normative characterization of the mental. Representation does not require a special substance. The capacity for representation is a function of what the being can do, and normative status isolates the right kind of performance. My concern is to make this lesson consistent with an evolutionary continuity between our minds and animal minds. Second, there are reasons internal to Brandom's project in *Making it Explicit* for holding onto Lesson (1) and modifying the conception of normativity. The pragmatic priority of force over content means that what a creature does or is capable of doing is logically prior to what it is capable of representing. But *doings* come in degrees. This suggests that the way to spin the Kant/Hegel/Brandom conception of normativity is to emphasize that normativity (and hence representation) comes in degrees and that the related distinctions—authority/compulsion and sapient/sentient—are endpoints of continua. While *Making it Explicit* does not speculate on origins, it has a strong evolutionary rhetoric. The philosophical account shows how complex capacities are built from simpler ones:

...no attempt will be made to show how the linguistic enterprise might have gotten off the ground in the first place. But it should be clear at each stage in the account that the abilities attributed to linguistic practitioners are not magical, mysterious, or extraordinary. They are compounded out of reliable dispositions to respond differentially to linguistic and nonlinguistic stimuli.

Nothing more is required to get into the game of giving and asking for reasons....  
(Brandom 1994: 156)

By reminding us of Darwin's place among the mighty dead, I am insisting that this evolutionary rhetoric be taken seriously and be made consistent with what we know about evolution and the mental capacities of non-human animals.

Keeping a normative conception of the mental and admitting that normativity, autonomy, and sapience come in degrees is not a straightforward task. The Kantian lessons will need to be modulated, if not modified. To figure out how, we need to look at the real differences in psychological capacity among animals (including humans), both social and asocial, like us and unlike us. This will give us a concrete basis for deciding just how to adjust the Kantian lessons. Doing so in a substantive and complete way would be a large undertaking, too large for a short commentary. In what follows, I will discuss the tantalizing research on transitive inference and draw some tentative conclusions about its consequences for the Kantian lessons.

Transitivity is a fundamental property of inference. At the formal level, transitivity is exhibited by conditional syllogism, conditional proof, and it is at the heart of our ability to draw conclusions from chains of inferences. Materially, it is exhibited by relations like "greater than" or "stronger than." Piaget—well known to be a Kantian—postulated that the ability to make transitive inferences developed in children around the age of seven (Piaget 1928). In the early 1970s, the ability to make transitive inferences was demonstrated in children as young as four by making the experimental task less dependent on language and memory. Bryant and Trabasso (1971) used five color-coded rods of different lengths. During the training phase of the experiment, the

children were shown only the colored ends of the rods. They were paired in adjacent lengths:  $A > B$ ,  $B > C$ ,  $C > D$ ,  $E > F$ . After seeing only the colored ends and guessing which was longer, the child was shown the length of the rods. The children quickly learned the color/length comparisons for adjacent lengths. Then they were shown the colored ends of non-adjacent pairs. If able to make a transitive inference, the child will judge that  $A > C$ ,  $B > F$ , and so on. The critical test for transitive inference is the  $B > D$  pair. The subject will have never seen this pair together, and each rod will have been judged both longer and shorter than other rods.

Bryant and Trabasso's task is easily generalized to any situation where an animal can be conditioned to select A over B, B over C, etc., and then tested for a preference of B over D. It wasn't long before experimenters showed that chimpanzees, spider monkeys, capuchin monkeys, pigeons, hooded crows, pinyon jays, scrub jays, and rats could all be trained to make specific transitive inferences. There is some evidence that animals that are more social seem to be better at it (Bond, Kamil, and Balda 2003). Research for this essay turned up only one species known to fail the transitive inference task: honeybees (Benard and Giurfa 2004). They successfully learn the relations, but do not 'make the inference.' The researchers suggested that honeybees may not have the memory capacity that is necessary, but the matter is probably not so simple. DeLillo and colleagues created a simple, back-propagated neural network with only three hidden units that successfully learned to make transitive inferences (De Lillo, Floreano, and Antinucci 2001).<sup>1</sup> The cognitive strategies and neurological basis for the ability to make transitive

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<sup>1</sup> Interestingly, the network exhibited biases similar to those demonstrated in psychological studies. Human and animal subjects make faster and better judgments when the terms are farther apart in the

inferences are still under active dispute among psychologists and biologists. It may even be the case that different animals use different mechanisms, and that these differences might explain differences in performance among species.

This research program raises two questions for our investigation of the Kantian lessons. First, is transitive inference really inference? This may seem like an odd question, but the Kant/Hegel/Brandom account sets high standards for something to count as inference. The act of drawing the inference must be assessable as correct or incorrect, and its correctness must be constituted socially. So, these behaviors must be embedded in the right kind of social context if they are to count as inferences at all. Second, granting that transitive inference is a form of inference, does it give rise to conceptual content? Concepts corresponding to the material component of these inferences (*e.g.* ‘longer than’ in the colored rod experiment) would be given content by their inferential role. This means that the individual inferences have to be understood as part of a system of judgment and inference. To answer the above questions, then, we need more than the experimental results cited earlier. We need to know whether the animals that pass these transitivity tests are engaged in a broader range of social behaviors. And the details matter, because the difference between genuine normativity and mere behavior depends on exactly what the animals can do.

Pinyon jays provide a very suggestive example for Kantian rumination. Pinyon Jays are Corvids, the family of intelligent birds that includes Ravens, Crows, and

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series. They also make faster and more accurate judgments when the first or last terms are involved. Finally, judgments involving the first term are faster/better than those involving the last. The network showed all three of these effects (De Lillo, Floreano, and Antinucci 2001: 65)

Nutcrackers. Pinyon jays live in large flocks and exhibit very sophisticated social behaviors, including a communicative system of calls, a linear dominance hierarchy, altruism, and a coordinated response to predators. In a very interesting piece of research, Guillermo and colleagues (2004) showed that Pinyon Jays make transitive inferences about dominance relations. It is known that Pinyon Jays establish linear dominance relations in the wild. Guillermo separated three groups of male Jays and let them establish dominance relations among themselves. He then let birds observe dominance interactions between other jays. The observer bird would watch bird A dominate B, and B dominate C. The observer had no prior contact with A or B. The observer and bird C were members of the same group,<sup>2</sup> and the observer bird was lower in the dominance hierarchy than bird C. If the observer jay is making a transitive inference, then when brought into contact with B, the observer should be submissive, even though bird B had been observed to both win and lose dominance interactions. Guillermo's Jays uniformly responded in this way.

The ability to make transitive inferences about dominance would be useful where the social organization depends on dominance. Naturalistic studies have confirmed that Pinyon Jays have clear dominance hierarchies. Marzluff and Balda (1992: Chapter 6) studied a flock of Pinyon Jays with marked individuals (including 39 adult males)<sup>3</sup> at a feeder too small to accommodate the whole flock. In a two-year study, they found that one bird (the alpha male) won almost all of the agonistic encounters in which he engaged.

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<sup>2</sup> In the control group, all of the observed birds were strangers to the observer.

<sup>3</sup> Dominance relations hold among adult males, adult females, and juveniles, and between these groups. The discussion in this paragraph refers to the dominance hierarchy among adult males.

Below him was a group of birds that won the vast majority of their encounters (around 80%). Encounters among birds within this dominant group showed a linear hierarchy. One way in which dominance is manifested is in an encounter where one bird forces another from a feeding spot. The encounter is initiated when one bird turns his body and/or head to stare at another, then leaning or stepping toward it. Sometimes, the dominant bird (the winner) would peck the subordinate (23% of the encounters). The other typically responded by turning toward the first bird and crouching or leaning away. It then either hopped to another spot to feed, or flew off. Occasionally, the subordinate bird will adopt one of two stereotyped postures: (1) it raises its bill straight up, extends its legs, and holds perfectly still; (2) it crouches, extends its head horizontally, and flutters its wings. It is interesting that whether the loser gives such an “appeasement gesture” depends on the loser’s status. Birds in the top half of the dominant group made appeasement gestures 4% to 5% of the time, while birds in the lower half of the dominant group responded this way 11% to 12% of the time. Adult males not in the dominant group responded with appeasement gestures in 17% of their losses (Marzluff and Balda 1992: 118). A subordinate bird that performed an appeasement gesture would not be pecked. It would remain on the feeding platform, and sometimes resume feeding.

In this social context, it is, perhaps, not too much of a stretch to think of the jay’s transitive inferences concerning dominance as socially articulated. Suppose bird C is already subordinate to B, and observed A dominating B. If bird C attempted to dominate A, it would be a kind of mistake, and such a mistake would be open to the sanction of bird A. If, on the other hand, bird C made appeasement gestures, A would reward C by letting it remain on the feeder. This story fits Brandom’s account of normativity at a

number of points: the animals have attitudes to reward and punish each other, and these attitudes create something like entitlements. The inferential norms established by these responses are the ground for something like a concept of 'dominance.' In observing A dominate B, the observer bird is making a 'judgment,' and it is a consequence of this judgment that whoever B dominates will also be dominated by A.

The Pinyon Jays have a very simple inferential system, and as a result the concept of dominance is rather thin. Philosophers have often noted that animal beliefs and concepts must be coarse-grained as compared to our own (Macintyre 1999; Searle 1994; Stich 1983). Since they have no language in which to make the distinctions, it is impossible to distinguish finely among many possible objects of belief. Similarly, it is impossible to distinguish among beliefs, guesses, wishes, and so on. Philosophers have used this as a reason to be skeptical about animal beliefs or concepts. If we extend the Kant/Hegel/Brandom account of content into the non-human realm by treating normativity as a matter of degree, we can counter such skepticism. The content of the jay's judgments about dominance is exhausted by consequences to which they hold each other responsible. In this respect, the content of their beliefs and concepts are no different from our own. Non-human representational states are more coarse-grained than ours because the practices in which they are embedded are simpler.

Realistically, we must recognize that, even with such a generous interpretation of these intriguing facts, the Pinyon Jays' behavior falls well short of what is demanded by the Brandom/Kant/Hegel account of sapience. We might (again, being as generous as possible) interpret the jays' behavior as constituting entitlements, but commitments seem out of reach. Brandom conceives of entitlements as consequences of practical attitudes.

A being is entitled to do something if and only if one or more others attribute to that being the authority to do it. That is, the others practically divide possible performances into those that are authorized and those that are not, and they are disposed to sanction those performances that are not authorized (Brandom 1994: 161). By its action, the Pinyon Jay that loses a dominance encounter might be interpreted as attributing authority, and thus entitlement, to the winner. However, the behavioral system is too simple to create commitments. Commitments are similarly constructed<sup>4</sup> from practical attitudes, but they are more complicated. To undertake a commitment, the animal must again do something toward which others take a practical attitude. In this case, the others treat some future performances as those for which the committed animal is responsible, and they are disposed to sanction *non*performance. These sanctions are themselves taken as correct or incorrect by others. An animal that undertakes a commitment acknowledges it by treating the sanctions for nonperformance as something to which the sanctioner is entitled. There is, apparently, nothing in the Jay's behavior to support commitments. If bird C makes a mistake by performing a dominance display for A, and A makes a similar mistake by acting submissive, then no other bird is going to step in to correct things. Moreover, full-blooded commitments require that the animal undertaking them to be aware of the

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<sup>4</sup> By this term I do not mean to suggest that Brandom's account is reductionist. He explicitly disavows any attempt to reduce normative vocabulary to non-normative vocabulary (Brandom 1994: 44). Hence, the practical attitudes themselves have to be understood as normative. However, there is a tension between this anti-reductionism and the commitment, expressed in the quotation above, that nothing new "is required to get into the game of giving and asking reasons." Indeed, this interpretive knot is at the root of the concerns expressed in this essay.

consequences. Since the birds do not have a language in which such inferences have been made explicit, they cannot self-consciously undertake a commitment. According to the Kant/Hegel/Brandom story, without the capacity to undertake commitments, the Pinyon Jays cannot be making judgments in the full-blooded sense. Hence, they are not truly making inferences, and are not fully sapient.

Are we to conclude that these birds are merely sentient? That seems wrong. There is a remarkable difference between Pinyon Jays and animals that we might describe as merely responsive to their environment without conceptualizing it in any way. (What would go in this category anyway? Butterflies? Snails?) The difference between highly intelligent animals and the merely sentient is a cognitive difference. So, to fasten on the difference between our practices and the social interactions of the Pinyon Jays, and then infer that since they fail to be sapient they must be only sentient, would be to fall prey to a false dichotomy. We are sentient *and* sapient (on our good days). Given evolutionary continuity, we must differ from animals like chimpanzees, dolphins, and Pinyon Jays only by degree, just as they differ from the less intelligent animals. Therefore, sentience should not be opposed to sapience; it arises by degree. According to the Kant/Hegel/Brandom story, sapience emerges as the animals are able to respond in more sophisticated ways toward each other, and as these responses become socially mediated. On the Kant/Hegel/Brandom view, then, we should not insist on a dichotomous distinction between sentience and (mere) sapience. As we will see below, however, effacing the line between sentience and sapience has far-reaching consequences.

The sapient/sentient distinction is not the only one to be overdrawn. The autonomy/compulsion distinction is another source of our difficulty. The Pinyon Jays may not be autonomous in a full-blooded sense, but we should not thereby conclude that their actions are nothing more than compulsions. Part of the problem, I suggest, is that we tend to think of the autonomy/compulsion distinction from the standpoint of the rights and privileges of a particular status. Fixing authority or entitlements determines what counts as autonomous choice or compulsion. The sergeant chooses to advance the squad; when the order goes out, compliance by the privates is compulsory. The sergeant is authorized to give orders, the privates are not. Hence, the sergeant is autonomous in a way that the privates are not. At the same time, the privates can choose not to move forward; the sergeant is not pulling them with ropes. Their autonomy lies in their ability either to comply or to refuse and face the consequences. Brandom makes just this point in his discussion of positive freedom: autonomy is given content by a system of norms. It follows that the content of the positive freedom of a nonhuman animal will be determined by the local social (and perhaps physical) environment. It would be a mistake to regard an animal as not autonomous just because it does not participate in our system of norms. The Pinyon Jays occupy social statuses that are instantiated by the attitudes of their fellows. A jay has the ability to respond to another's dominance display by his own display of a submissive attitude, by simply flying away, or by a dominance display of his own. Applied in the context of their own social behaviors, Kant's conception of positive freedom entails that the jays are autonomous, albeit in a different and more limited way than we are.

A more metaphysical way of making the point is this. We live in a world of causes. If we reject an ontological distinction between mind and mindlessness, then entry into the space of reasons is not an exit from the world of causes. Rather, the social roles that give content to reasons add another layer of complex causal relationships that give substance to autonomy. We draw the reason/cause distinction from within a particular space of reasons. What counts as a reason (rather than a cause) depends on the social relationships established by the creatures. Within the Pinyon Jay's space of reasons, a jay autonomously responds to a dominance display, and thereby is 'normatively constrained' by the reactions of the group.

I have been arguing that making the Kant/Hegel/Brandom story consistent with evolutionary continuity requires treating the autonomy/compulsion and sapience/sentience distinctions as non-dichotomous. Autonomy and sapience are matters of degree, and they depend on the sophistication of the animals' attitudes and social interaction. Notice that this requires a modulation, at least, of Lesson (4). We ought not to think of autonomy only in terms of the self-conscious adoption of an explicit law. This model is only appropriate for language users, and then perhaps only in peculiar circumstances. Tweaking lesson (4), however, will require tweaking lesson (5), the social conception of normativity. The jays have no practice of criticism. Their practices, while complicated, are simply not complicated enough. If we are going to make continuous out of the authority/compulsion and sentient/sapient distinctions, then we will have to recognize a variety of simpler social arrangements as genuinely confirming normativity, albeit normativity of a simpler kind. The norms that constitute the social roles of Pinyon Jays may be little more than Kripke-style regularities; the responses of other birds

determines whether a given response to a dominance display is correct or incorrect. If they act submissively toward the newly dominant bird, then the response was correct; if they challenge, then it was incorrect. This would make the dominance hierarchy a normative one, and it would give the concept of dominance the normativity required by the normative conception of the mental. However, such norms would have very different properties from our own, and probably differ among social species.

Even this thin sense of normativity, however, may demand too much. The ability to make transitive inferences does not require sociality. Scrub Jays are quite similar to Pinyon Jays, but they are relatively asocial. They too can make transitive inferences, though it is interesting that Pinyon Jays are better at it (Bond, Kamil, and Balda 2003). It is likely that many animals can make transitive inferences, even if they are not social. After all, a simple connectionist network can be trained to do so.<sup>5</sup> The ability to make the inference does not seem to depend on social relations. If we hang onto the fifth lesson, that normativity is socially articulated, we have to either say that such abilities are not inferences, or accept that they are inferences and modify the fifth lesson. Again, evolutionary continuity seems to demand that we recognize the inferences and tweak the lesson by admitting degrees of normativity.

From a Brandom/Kant/Hegel point of view, this seems to be a *very* thin sort of normativity. Why recognize transitive inferences in asocial beings as inferences at all? Several arguments suggest themselves. First, an animal has to have a particular kind of mind—indeed a quite sophisticated sort of mind—if it is to be able to engage in practices

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<sup>5</sup> Of course, it should not be regarded as trivial that the connectionist network is *trained* by the human programmers. Their practices determine the correctness of the inference.

at all. If we insist that only social practices can confirm normativity, then we seem to be caught in a chicken-and-egg dilemma. This can be dissolved (the way all chicken-and-egg questions are dissolved) by recognizing continuity between simpler and more complicated forms. If there are some inferences that are not socially constituted, but have their normativity confirmed, say, by direct reinforcement from the environment, then simpler animals can make inferences, have representations, and be minded in a way that might set the stage for the development of practices or traditions.<sup>6</sup> Second, according to the Kant/Hegel/Brandom story, social practices arise when animals exhibit attitudes to reward or sanction another's behavior. Before such attitudes could evolve, the animals must have the ability to behave in the way that is the object of the attitude.<sup>7</sup> Hence, we need to treat the capacity to make transitive inferences as a genuine form of inference, albeit thinly normative.

Evolutionary continuity demands that we treat the sapience/sentience difference as endpoints of a continuum, not a distinction. This has led me to argue that normativity

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<sup>6</sup> There has been quite a bit of recent work on the development of “cultural traditions” among animals. This provides material for much reflection on the character of minds and norms. See Frigaszy and Perry (2003)

<sup>7</sup> Arguably, the ability to make transitive inferences is a prerequisite for social systems that depend on dominance. If the number of animals in a community is sufficiently large, no one animal will be able to view all the possible interactions. It will have to find its place in the hierarchy by inference.

and autonomy come in degrees.<sup>8</sup> The considerations so far indicate the general outlines of a result. I will rashly propose it and then recklessly leave the scene. Perhaps the difference between the endpoints of the sapience/sentience scale could be represented as externalist and internalist. These are terms of art in epistemology, but I am not intending to exploit their technical senses. By “externalist,” I simply mean that content and correctness are constituted by relationships between the organism and the environment. On the limiting end of mindedness—mere sentience—there are no practices at all, but beings can be said to have representations insofar as they have internal states that track changes in the environment. The animals’ inferences are good insofar as they are reliable in their environment. The relatively asocial animals who make transitive inferences are thus tracking a natural property of their environment (*e.g.* ‘longer than’). More socially oriented animals embed this ability in nascent social practices. By making transitive inferences about dominance, the Pinyon Jays are doing something new. Dominance does not have to be transitive and asymmetric; dominance circles or tangles are possible.<sup>9</sup> The Jay’s attitudes create linear dominance relations and at the same time police the inferences in a normative way. On the fully sapient end of the spectrum, language permits us to make practical attitudes explicit, and enables a whole universe of new commitments. Our concepts are holistically and normatively defined, and in this sense

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<sup>8</sup> The discussion here has focused on lessons (4) and (5). While there has not been time to explore the consequences of evolutionary continuity for lessons (2) and (3), these will obviously need some massaging as well.

<sup>9</sup> Female mountain goats, for example, are known to have agonistic interactions, but do not form stable, linear dominance hierarchies (Fournier and Festa-Bianchet 1995).

their correctness and content is “internalist.” Sapience gradually arises from sentience through the co-evolution of social organization and psychological capacities.<sup>10</sup>

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