

TWO ACCOUNTS OF MORAL DIVERSITY: THE COGNITIVE SCIENCE OF PLURALISM AND ABSOLUTISM

John Bolender, Department of Philosophy, Middle East Technical University, Ankara

Psychology is relevant to judging moral theories. Ever since G. E. Moore's discussion of the naturalistic fallacy (1903), many philosophers have denied this, but the charge of irrelevancy overlooks the fact that the assumptions on which a moral position rests often include non-moral elements. If the non-moral bits are wrong, the moral position will often be undermined. This paper concerns some of the descriptive assumptions of value pluralism and absolutism, and the prospects for cognitive science evaluating those assumptions.

Pluralism's descriptive assumptions are that there are moral conflicts and that they sometimes cannot be resolved in a way which all participants would find fully persuasive. Possibly, I could never be persuaded that the moral principles recognized in some other culture reflect obligations, even if I can understand to an extent (empathetically or rationally) how others might think that they do, and that at least some of the members of that other culture find themselves in the same position with regard to my principles. Expose all of us to the relevant non-moral facts as much as you will, have us engage in civil debate appealing to reason as best we can, boost our respective intelligences as far as humanly possible or select among us equally for moral genius, resolution would nonetheless not occur. Either each side would see nothing compelling in the other's values, or they would perceive something compelling, but it would not be enough to persuade them to change their values.

Richard Brandt usefully distinguishes three claims comprising "moral relativism" (1968), although his "moral relativism" is what I here call "pluralism." The claims are: that there are

conflicting moral judgments; that there is no method for resolving these conflicts that all would find persuasive; and that these conflicts reflect conflicting obligations. Only the third claim is wholly normative, the other two being open to empirical scrutiny. Let us consider pluralism and absolutism more closely to see how cognitive science can be relevant in judging them.

Defining Moral Diversity and Pluralism

In defining pluralism, it is useful to note that some moral principles are more basic for an agent than others. One may hold to the principle that it is wrong to gossip maliciously, but this would not be a basic moral principle for a typical person. For most agents, the prohibition against malicious gossip probably flows from some more general principle, (say) that suffering should be minimized, in conjunction with some descriptive claim, (say) that malicious gossip runs a great risk of increasing suffering. A moral principle is *basic for an agent* if the agent would not try to justify it by appeal to any other moral principle (whether in conjunction with a descriptive claim or not) (Brandt, 1984).

According to *strong moral pluralism*, for *any* humanly possible basic moral principle, *it is humanly possible* that there is some other basic moral principle which conflicts with it such that there would be no unanimous consent for resolving the dispute no matter how much information, time, and leisure were available. The expression “humanly possible” is used to show that mature, biologically normal humans are at issue. “Unanimous consent” refers to the community of all humans and obviously indicates an ideal, since a conference of our whole species is infeasible. The second occurrence of the phrase “it is humanly possible” is italicized to stress that this strong pluralism can be true even if there is some basic moral principle which everyone *happens* to accept. It is the mere possibility of irresolvable conflict which pluralism requires. Furthermore, the word “any” is italicized to stress that there is no humanly possible basic principle immune to

such challenge. In other words, there are no moral absolutes. That is the point of strong pluralism.

Weak moral pluralism is the view that there are *at least some* humanly possible basic moral principles which make incompatible demands such that one could not coherently accept them all, and it is humanly possible that there would be no unanimous agreement among non-pathological, relevantly-informed adults about how to choose between them. The difference between weak and strong pluralism is the difference between “some” and “all.” The weak pluralist could admit that there are some basic principles that all would accept, at least in the last analysis, but that not all basic principles enjoy this status. The strong pluralist, by contrast, claims that all humanly possible basic principles fail to be absolute.

Absolutism is the view that there are basic moral principles which would not irresolvably conflict with any humanly possible values. For these principles, reasonable discussion is possible to the point of wholly resolving any disagreement. One can also speak of weak and strong forms of absolutism. If all value conflicts are ultimately reconcilable, then *strong absolutism* is true. If this is only true of some value conflicts, then *weak absolutism* is right. To espouse strong absolutism is to deny strong pluralism. Weak absolutism and weak pluralism are mutually compatible, although the extent to which one applies is the extent to which the other does not.

If weak pluralism is the topic, then pluralism can be a matter of degree: Pluralism pertains to the extent that there are basic moral principles prone to this sort of undecidability. And, of course, these definitions should be supplemented with the normative claim that the incompatible basic principles reflect conflicting obligations.

The definition of moral pluralism in terms of basic moral principles may seem to require a psychological assumption. But it doesn't. The question is not necessarily whether basic moral principles enjoy psychological reality, for basic moral principles may be an abstraction from an

agent's moral intuitions in the manner of John Rawls' "decision procedure for ethics"(1972) rather than a matter of unconscious mental representations which cause those intuitions.

But what if it turns out that a normal agent has such fickle moral intuitions, varying so much from one circumstance to another, that one cannot abstract any consistent set of basic moral principles from the sum of them? I have not ruled this out in defining pluralism. If the moral intuitions of an agent turn out to be so motley, one can still speak of the basic principles which cause, or which are abstractions from, the agent's moral attitudes at a given time. This would open the possibility that moral pluralism could be spoken of even if one were only considering one individual: That person may have different basic moral basic principles on different occasions, and there may be no rational way of adjudicating between these various basic principles. One could have here an even greater extreme of moral pluralism, one in which the individual finds him- or herself assuming incompatible basic moral principles with no objective means of deciding between them.

Going even further, it is conceivable that a normal agent may have conflicting moral intuitions at one time, intuitions so mutually incoherent that one cannot abstract basic principles. Very well, one can still divide the intuitions into non-overlapping, self-consistent sets, each of which corresponds to some coherent group of basic moral principles. In other words, we could imagine a single individual who is "multi-moral," whose intuitions correspond to conflicting moral principles, who may even be obligated by conflicting principles, but who can arrive at no means of resolution. Moral decision making under rationally irresolvable conflict turns out to be a special case of pluralism.

Isaiah Berlin contrasted relativism and pluralism. But I find it more useful to categorize relativism as an extreme form of pluralism, since Berlin's conception of relativism falls within my definition of pluralism. Berlin does not define relativism rigorously, but he does convey the

idea well enough: “I prefer coffee, you prefer champagne. We have different tastes. There is no more to be said.’ That is relativism.” Berlin claims that this view stands in contrast to pluralism, “the conception that there are many different ends that men may seek and still be fully rational, fully men, capable of understanding each other and sympathising and deriving light from each other, as we derive it from reading Plato or the novels of medieval Japan – worlds, outlooks, very different from our own” (1990: 11).

If I like coffee and hate the taste of champagne while you are the reverse, I should not find your taste reasonable or unreasonable. Your taste would neither make sense nor fail to make sense to me. I could only note that our tastes differ and perhaps seek some causal explanation or perhaps even insult you, but without saying why your taste is wrong. But the moral values of a radically different society, provided that it is a human society, will make some sense to me and somehow seem compelling even if only partially, even if the degree to which they seem compelling and make sense is not strong enough to make me feel that I should adopt them. My sympathy could be mixed with repulsion, and yet the sympathy and understanding remain. Were relativism true, there could be no discussion between cultures over their value differences except to note them, perhaps also to find some scientific hypothesis or creation myth to explain them, and perhaps even to call names. But there could be no discussion across cultures as to how the values on both sides of the divide make sense, where “making sense” can be understood either rationally or emotionally. But this shows relativism to be a form of pluralism as I have defined the latter. It is an extreme form of pluralism, precluding meaningful communication about the justification of the respective values. Berlin’s conception of pluralism can be called “mere pluralism” in contrast to relativist pluralism.

To clarify these concepts, it may be useful to distinguish two different sorts of diversity: disagreement and multiplicity. In the case of disagreement, one has some rational or emotional

understanding of why the other would find their viewpoint compelling. This is not the sort of understanding one finds in a causal explanation, but the ability to see the matter from the other's viewpoint. In the case of multiplicity, however, there is no such understanding. Relativism posits multiplicity, mere pluralism posits disagreement, absolutism posits neither, at least not under conditions of adequate information, rationality, and cognitive effort.

Even though relativism is an extreme form of pluralism, relativism cannot be equated with strong pluralism. The distinction between relativism and mere pluralism cuts across the distinction between strong and weak pluralism. Weak relativism is conceptually possible. That is to say, we may disagree over values in a relativistic way such that there can be no real communication about justification, and this disagreement may only pertain to some of our values. We could still agree on others.

If people with conflicting values can agree on ways of resolving their differences, I leave it open whether this common ground is rational. Its being common does not rule out its subjectivity. All normal human adults may be biologically programmed to agree on some crucial moral assumptions, but this is no guarantee that an Alpha Centaurian, no matter how rational, would find anything even minimally compelling in these assumptions. The Alpha Centaurian, let us assume, does not share our biological programming, and hence has a wildly different moral sense or none at all. Suffice it to say that even if the humanly common ground is subjective, it may still provide a basis for rational discussion. For example, if every human can agree, upon proper reflection, that maximizing utility is a basic moral principle and that no other principle could override it, and even if this agreement is based on nothing rational, i.e. smart space aliens *could* deny it, then one is still left with the rationally assessable question of whether or not some specific act or policy maximizes utility. On the definitions adopted here, this would not be pluralism. The subjective basis is not enough to make it pluralistic.

Is Moral Diversity Partly an Illusion?

One might suspect that there is less real diversity (disagreement or multiplicity of basic principles) than meets the eye; perhaps the appearance of conflict is largely due to disagreements about facts. The obvious objection to this view is that the moral common sense of one culture or historical period may be wildly at odds with that of another. But a difference in moral judgment, even when it appears to be wild, does not automatically imply a difference in basic moral principles. There may be universal moral values which are applied differently by different cultures due to different descriptive assumptions (Brandt, 1959; McGinn, 1997; Levy, 2003).

But I doubt that all differences in moral judgment can be so explained. Brandt provides a plausible example of diversity in basic moral principles. Hopi Indians traditionally had less concern for the pain experienced by animals than one would expect from a typical suburban Westerner. The Hopi would play a game called “chicken pull,” in which a chicken is buried up to its neck in sand. Contestants fight for the chicken, trying to grab it by the neck as they ride by on horseback. When someone eventually grabs hold of the chicken, the other will try to grab the chicken away from him, likely tearing it apart. The winner is the one who ends up with most of the chicken. Hopi children would also catch birds and keep them as toys by tying their legs together. The birds might starve to death or have their legs and wings broken while being played with. The treatment of the birds was of no great concern to Hopi parents. Brandt looked for factual assumptions that might explain how the Hopi could do these things with a clear conscience, e.g. believing that animals do not feel pain or that a tortured animal will have an especially nice afterlife. He could find none, and so he concluded that there is some difference of moral principle between industrialized Westerners and the Hopi (1954: 213-15, 245-46, 373). I

will try to show that nativist conceptions of moral cognition are relevant to deciding the plausibility of pluralism and absolutism.

Cognitive Science: Nativism

Nativism is the view that specific properties of the mind are constrained by biologically innate factors. *Moral nativism* is the view that human moral judgments are largely constrained by innate factors (1). In time, a more specific conception of moral nativism may develop as we learn more about the precise forms that these constraints take. There are good reasons for believing in moral nativism, and this is relevant in deciding whether or not there may be irresolvable moral conflicts. At first blush, it might seem that moral nativism militates against pluralism. But maybe not; in fact, moral nativism may help us better understand how value conflicts can be irresolvable.

The classic case for nativism in the cognitive sciences is Noam Chomsky's *poverty-of-the-stimulus argument* for syntactic nativism (1980: 34). According to Chomsky, if a perceptual stimulus contains less information than the response, then the response is partly due to information already encoded in the organism. In the case of language, the poverty-of-the-stimulus argument is the claim that the knowledge acquired in mastering a language is much greater than the information found in the environment. It is obvious that the environment plays a crucial role in language acquisition, but, for Chomsky, the environment alone cannot explain the richness and complexity of the linguistic knowledge acquired. Nor can it fully account for the sameness of what is acquired from one child to another (Laurence and Margolis, 2001).

Chomsky speaks of the linguistic input, the data that the child receives, as "degenerate," meaning that the child hears misleading or incomplete utterances. Children hear utterances which are broken off by hesitation or interrupted by coughing or distorted by a stammer, or the

child will hear sentences which are badly formed due to performance errors, e.g. the speaker losing track of singular-vs.-plural in the course of a longish sentence. We take it for granted that these are not properly formed sentences, but a child without innate syntactic ideas should not be expected to know this.

The child with an empiricist psychology would also be misled by sentential transformations appearing to point to one sort of rule, when in fact the actual linguistic rule is quite different. Consider an illustration involving *movement*, the transformation of one sentence into another by reordering elements. Let's suppose that Locke was right about the mind; the infant's mind is like white paper upon which experience impresses all the concepts which it ever shall acquire. Now let us imagine how this white-paper child, growing up in an Anglophone community, would learn about movement. Suppose that the child hears the following utterances on various occasions:

"The book is on the table."

"Is the book on the table?"

"The red book is on the table."

It would be natural for the white-paper child to conclude that the following is a well-formed sentence, even though we know that it is not:

"Book the red is on the table?"

The white-paper child would reach this conclusion because it hypothesizes (2) the rule that moving the third word to the beginning forms a question. Judging from the first two sentences

alone, this would seem to be a rule of English. So one would expect the innately uninformed child to infer that the third sentence can be made into a question using the same method. But this is not how real flesh-and-blood children operate. Unlike the imaginary white-paper child, real children already know that movement is sensitive to parts of speech. They do not make the sort of mistake just described (Stromswold, 1999).

Discerning parts of speech requires an extra effort after determining which sounds in the sentence are words. One might expect the child to arrive at the simpler hypothesis first, namely that one forms a question just by moving items according to their original positions. Or, if one ignores the problem of how the child recognizes parts of speech, one might expect the child to follow the rule *move the first verb to the beginning of the sentence*. But even this rule would produce deviant utterances, e.g. in transforming “The man who took the cash left town” into a question. This means that children, in acquiring competence in moving sentential elements, are not inferring to the simplest explanation of the data but are gravitating toward a remarkably complex explanation. This strongly suggests not only that there is innate knowledge but that there is innate knowledge specialized for syntax. Movement, in all natural languages in which movement occurs, is sensitive to parts of speech. In no natural language are the rules for movement linear, i.e. they are never sensitive merely to the position of elements in the original sequence of sounds.

In discussing the incomplete and misleading nature of much of the child’s linguistic experience, Chomsky does not quantify how much is “degenerate.” This may raise the question of whether he has shown that enough of it is degenerate to make a good case for nativism. But, for Chomsky, even if only a small percentage of the data are degenerate, this shows that the child cannot be following some general-purpose hypothesis-forming procedure. One can see the point by considering someone who does use a general-purpose hypothesis-forming procedure, namely

the adult scientist. How much of the scientist's data would have to be misleading for the scientist to be unable to arrive at a satisfactory theory? "[S]uppose that a scientist were presented with data, two per cent of which are wrong (he doesn't know which two per cent). Then he faces some serious difficulties, which would be incomparably more serious if the data were simply uncontrolled experience, rather than the results of controlled experiment, devised for its relevance to theoretical hypotheses" (Chomsky quoted in Lyons, 1991: 135-36).

In the case of all movement being structural, or sensitive to parts of speech, we have an example of what Chomsky calls a *linguistic universal*, something common to all natural languages. The child is able to compensate for incomplete or otherwise misleading input. Chomsky's conclusion is that certain principles for constructing sentences are innately known, being forced by genetic constraints. The innate linguistic universals constitute what he calls "universal grammar," the system of rules and principles common to all natural languages. For Chomsky, it is a linguistic universal that movement relies on relations between parts of speech in a sentence and not on, for example, word order (1971) (3).

A poverty-of-the-stimulus argument can be applied to moral knowledge. In reference to moral competence, "whenever we see a very rich, intricate system developing in a more or less uniform way on the basis of rather restricted stimulus conditions, we have to assume that there is a very powerful, very rich, highly structured innate component that is operating in such a way as to create that highly specific system on the basis of the limited data available to it..." (Chomsky, 1978: 241; see also 1988a: 152-53; McGinn, 1997: 44-9; Dwyer 1999, 2004). This is just an appeal to common sense, but there are also controlled data suggesting that infants have rich knowledge which is at least proto-moral.

One important element of moral judgment is the ability to distinguish objects which have goals from those which do not. Infants can recognize goal-directedness insofar as they can

distinguish self-propelled from other-propelled objects (Premack, 1990). Studies with infants also indicate concepts of hurting, helping, reciprocity, belonging to a group, ownership, and liberty and also that infants have certain expectations concerning the interrelations of these concepts (Premack and Premack, 1994). Even though infants do not speak, their preferential looking (noting which image the infant prefers to look at) and habituation (presenting the infant with a stimulus repeatedly until it starts to respond for shorter periods of time) can be measured as responses to images of dots and lines on a computer screen. Preferential looking shows interest or surprise, so it reflects how the infant expects physical objects to behave. Habituation can be used to measure how well the infant makes discriminations.

Turning briefly to adults before returning to children: Adults will automatically see certain kinds of dot-and-line behavior as goal-directed. For example, if there is a broken vertical line on the screen and a dot right next to it moving up and down just to the point of the break in the line, the adult will see the dot as trying to pass through the break. Generally speaking, persistent action toward a single item is seen as goal-directed. Liberty, entrapment, and aesthetics are also readily perceived. A bouncing dot can become trapped in a virtual hole. A dot bouncing higher and faster is seen as more attractive than one bouncing lower and more slowly. These concepts can be used to gauge perceptions of helping and hurting. If one dot restores the motion of another dot trapped in a virtual hole, in other words if one dot frees another, this will be seen as helping. If one dot causes another to be more attractive by causing it to bounce higher and faster, this too will be seen as helping. Not surprisingly, causing a dot to lose its liberty or be less attractive will be seen as hurting. Furthermore, soft and weak motions among dots will more likely be coded as positive and hence will more likely be seen as helpful. By contrast, abrupt and strong motions will more likely be coded as negative and hence seen as hurting (Premack and Premack, 1994).

Infants' preferential looking and habituation can be used to determine when expectancies are met and when defied. Judging from patterns of preferential looking and habituation, infants distinguish helpful from hurtful actions because they expect reciprocation. If one dot helps or hurts another, they expect the latter dot to reciprocate in kind. There is an even greater expectation of reciprocity if the two dots behave as though they belong to the same group. To a small extent, dots which look alike tend to be perceived as belonging to the same group, whereas dots which do not look alike are seen as not belonging to the same group; but an even stronger criterion is sameness of motion. In the absence of any previous helping or hurting, infants will expect members of the same group to help each other. The concept of possession or ownership is also present. If one dot appears to exert power over another object, then hurting the overpowered object or liberating it from the other dot will be seen as hurting the other dot and reciprocation will be expected (Premack and Premack, 1994).

This is not, of course, to say that infants are capable of moral evaluation, but it is evidence that they have concepts which play important roles in such evaluation. These sorts of data in conjunction with more commonsense considerations of poverty of the moral stimulus make a good provisional case for moral nativism.

One might think that moral nativism is enough to refute moral pluralism, and it is true that, classically, talk of cognitive universals is often anathema to pluralists. There is at least a rough consensus that human diversity would refute nativism, or, equivalently, that a good case for nativism would debunk apparent diversity. The consensus, however, rests on confusion. One must bear in mind that poverty-of-the-stimulus considerations were first raised in recent times with regard to language, and linguistic nativism does not imply that everyone speaks the same language. Likewise, as we shall see, moral nativism need not imply that everyone shares compatible values.

Internal Representations

It is reasonable to expect that we will only understand moral judgment scientifically to the extent that it depends upon structures wholly internal to the organism. The same is true of language, which is why Chomsky speaks of the individual's "internal language" (2002; or "I-language," 2000). The internal language corresponds to a natural language, which, for Chomsky, embodies knowledge of sound, meaning, and how meanings and sounds are paired. More specifically, the internal language is the knowledge of a natural language corresponding to the individual's language faculty at some stage of maturation (2000).

Why should we narrow our focus to structures internal to the organism? Let us first briefly consider our goal, which is to devise theory. By "theory" Chomsky means an explanation with depth, e.g., Newtonian mechanics in which a small number of principles entails a wide range of phenomena with a high degree of exactitude, at least under controlled conditions. Theorizing in this sense requires much idealization (1980: 9-10). Idealization normally includes narrowing one's focus to the most immediate causes as a means of screening out interfering factors: "[T]he growth of a cell to a finger or a bone of the forearm depends on elapsed time, but the study of the process keeps to such indicators as current gradients of chemical concentration that inform the cell of such facts" (2000: 196). Barring action at a distance, the most direct causes are internal to the organism. This means that our best hope of arriving at a theoretical understanding of language or moral judgment very likely requires us to focus on internal structures.

We can make reasonable inferences as to the form these internal structures take. The mind exhibits an in-principle unbounded capacity to form moral judgments in response to novel situations, as noted by David Hume in his *Treatise of Human Nature* (Book III, Part I, Section II):

It may now be ask'd in general, concerning this pain or pleasure, that distinguishes moral good and evil, From what principles is it derived , and whence does it arise in the human mind? To this I reply, first, that `tis absurd to imagine, that in every particular instance, these sentiments are produc'd by an original quality and primary constitution. For as the number of our duties is, in a manner, infinite, `tis impossible that our original instincts should extend to each of them, and from our very first infancy impress on the human mind all that multitude of precepts, which are contain'd in the completest system of ethics. Such a method of proceeding is not conformable to the usual maxims, by which nature is conducted, where a few principles produce all that variety we observe in the universe, and every thing is carry'd on in the easiest and most simple manner. `Tis necessary, therefore, to abridge these primary impulses, and find some more general principles, upon which all our notions of morals are founded.

In other words, the most elegant explanation of this productivity is that the mind uses a small number of principles to generate a potential infinity. This applies both to the individual's ability to process the grammar of a potentially infinite number of sentences as well as to the individual's ability to morally evaluate a number of different sorts of situation without apparent limit. The ability to produce a limitless number of novel representations from a finite store of initial representations appears to be due to the computational procedure of recursion, namely the ability to apply an operation (e.g., addition) to its own result (e.g., $1+1=2$, $2+1=3$, $3+1=4$, and so on). The default position is that recursion is responsible for this infinity, since we have no idea otherwise how it would be possible.

In the case of language, a simple illustration of recursion lies in the ability to generate a new sentence by adding a "that"-clause to a pre-existing sentence, e.g. adding "Lee believes that ..." to any declarative sentence. The same operation can be applied an indefinite number of times. Hence, one infers, both in the case of language and in the case of moral judgment, that the mind/brain contains a finite number of representations and operations producing, at least potentially, an infinite number of judgments due to recursive procedures.

Diversity Arising from Universals

These comparisons to language show that the explanation of moral diversity may be quite similar to the explanation of linguistic diversity. Since this is relevant to the question of whether or not, or how far, pluralism is true, we must consider this in greater depth.

Why is there linguistic diversity? Let us, first of all, consider what it means to speak of linguistic diversity. On the present paradigm, it is to speak of a diversity of internal languages. Not only is it the case that different people have or know different internal languages, it is normally the case that the same individual uses different internal languages on different occasions. If an individual pronounces a word differently in different contexts, even that betrays a plurality of internal languages, since each internal language includes representations of how sound and meaning are paired (McGilvray 1999: 117). This means that each individual, in virtually any normal case, is multilingual. As we shall see at a later point, this may throw some light on how a single person can also be multi-moral.

Given linguistic nativism, how can it be that there are different internal languages? Chomsky's explanation lies in his "Principles and Parameters" (P&P) conception of innate grammatical knowledge (1981; 1988a). The P&P approach, as we shall see at a later point, is a model for some anthropologists and psychologists in their attempts to explain moral diversity. Let us consider P&P first in its application to language.

In learning a foreign language, one is often struck by how extremely different and surprising the grammar can be. It is news to hear that there is a substantial and rich grammar common to all natural languages. Don't the grammatical differences between Turkish and English, for example, refute grammatical nativism?

It might seem so, at least at first blush. A monolingual Turk just beginning to learn English or a monolingual Anglophone just starting to learn Turkish is bound to be struck by the

fact that the grammatical structures of the two languages often seem to run in opposite directions. In English, one says “in Istanbul,” while in Turkish, one says “Istanbul’da.” Where there is a preposition in English, “at,” there is a corresponding postposition in Turkish. In other words, the adpositions in English are prepositions, occurring *before* their complements; while adpositions in Turkish are postpositions, occurring *after* their complements. Adpositional phrases in English are prepositional phrases. Those in Turkish are postpositional. Far from commonality, the impression here is one of perfect opposites.

One finds similar differences as one continues to consider other parts of the grammars of the two languages. Consider verb phrases: In English, one commands another by saying “Speak Turkish.” In Turkish, one makes the same demand by saying “Türkçe konuş.” In other words, in verb phrases, the head of the phrase, i.e. the element characterizing the phrase, the verb in the case of verb phrases, occurs at the beginning in English while occurring at the end in Turkish. One finds a similar difference with regard to noun phrases and adjectival phrases.

Despite initial impressions, we have seen a pattern here, namely that English grammar is consistently head-first, while Turkish grammar is consistently head-last. And for Chomsky, the linguistic universal is precisely this: Any natural language is either consistently head-first or consistently head-last (4). According to Chomsky, the small child only needs to hear a few phrases of the ambient language to know that it is head-first or head-last.

When the child is acquiring a particular language, a parameter is set in the child’s mind/brain, a parameter being a specification of options which can be fixed in one of a small number of predetermined ways. The principles are innate, the parameters settings are learned. On P&P, it is a main goal of linguistics to discover the principles such that specifying the parameters will produce a good approximation of the grammar of each natural language. An internal language is not governed by rules specific to that language, at least not in the sense of

such rules being represented in the brain. Instead, the appearance of rules for an internal language is due to interactions among different principles and their various parameter settings. There are innate mental representations of the principles of all possible natural languages. What is learned are the parameter settings and vocabulary.

The point here is that linguistic nativism is compatible with there being more than one language. One cannot rule out a priori there being a theory of moral nativism which is compatible with there being irresolvable moral conflicts.

Relational Models Theory

The psychologist and anthropologist Alan Page Fiske has a theory of moral intuitions which applies the P&P approach to social intelligence. If right, his theory would also explain much of moral diversity. It would lend great support to mere pluralism while refuting relativism.

According to Fiske's *relational models theory*, there are four innate grammars explaining the construction, interpretation, and normative evaluation of social relations. They are as follows: *Communal Sharing* relations assume a bounded group the members of which are equivalent. Each member treats each of the others as the same. Intense love, close kinship, and nationalism are all recognizable as forms of Communal Sharing. *Authority Ranking* assumes an asymmetry, with people linearly ordered according to a hierarchy. Those higher in rank enjoy prestige and privileges lacked by those below, but the latter are entitled to some form of protection or pastoral care from the former. *Equality Matching* strives for an even balance or one-to-one correspondence. Examples include distributive justice, taking turns, in-kind reciprocity, and compensation by equal replacement. In such a relation, people are concerned with maintaining balance and keeping track of how balanced the relations are. In a *Market Pricing* relation, people attend to ratios and rates. All relevant features are made commensurate

by being reduced to a single value or utility metric. What matters is how one person or party stands in proportion to others, e.g. the ratio of what one pays versus what one receives in turn. Relations involving rents, tithes, wages, interests, and taxes are all examples. Money is a common Market Pricing metric but need not be in all cases. Trying to calculate how efficiently people spend their work time in relation to each other, even if no money is involved, is an example of Market Pricing.

On Fiske's relational models theory, these models explain the particular ways in which people interpret misfortune, structure their identities and systems of exchange, and make moral judgments. Since our main concern here is with morality, let us consider how each model produces a moral standard (1991: 116f).

As a moral ideal, Communal Sharing is the principle that people should share generously with other group members. Community needs take priority over one's own individual needs. However, this sort of generosity does not fit every sense of the word "altruism." It is not giving to someone or something alien to oneself. To the contrary, on the Communal Sharing model, all group members form a common substance. The individual identifies him- or herself with the group. To give to others in the group is to give to those with whom one shares an identity.

Authority Ranking implies two different sorts of moral obligation, depending upon whether one is, in the relevant context, superior or subordinate. The subordinate owes respect, deference, loyalty, and obedience to those in authority. Authorities have a responsibility to care for and attend to the needs of those subordinate to them. Those higher in rank are entitled to receive more social benefits than those of lower position. Authorities are also looked upon as shapers of norms.

Equality Matching motivates the desire for fairness and justice. This may include in-kind compensation, including strictly reciprocal revenge as well as uniform contributions.

Market Pricing motivates an ideology of freedom, especially the freedom to enter into contracts and to make promises. The individual should be given the freedom to choose how best to maximize utilities, taking calculated risks and then accepting the consequences. When individuals willingly commit themselves to agreements, they place themselves under enforceable obligations. Prior to such agreements, there are no obligations but only inherent rights to the freedoms just mentioned.

For Fiske, these models are biologically innate. The child is prepared to find them in his or her social milieu. What is not innate, on Fiske's view, is which model is to be implemented in a given situation and the form of that implementation. For Fiske, this learned element explains moral diversity. A social situation can be divided into parts such that different models structure those different parts, or the same model can be multiply embedded within itself. For example, people may vote on a law (Equality Matching) while the decision as to how to apply that law is the responsibility of officials (Authority Ranking). "By combining the elementary forms in various concatenations and nested hierarchies, people produce complex social forms" (Fiske, Haslam, and S. T. Fiske: 1991: 658). This allows for recursive embedding and hence also productivity (topics to be discussed in the next section).

The variables or options in implementing the models not only pertain to which model is to be applied to which social situation, but how it is to be applied. In the United States, leaders are chosen according to Equality Matching, each person having one vote. But how Equality Matching is here implemented has changed through U.S. history: Initially, only 21-year-old male propertied Whites voted. This has changed step-by-step over time to be more inclusive, so that now anyone at least 18 years of age who is not a convicted felon can vote (Fiske, 1992). This can be interpreted as an example of changing parameter settings relative to a single model. Elements of the other models can also be construed as having different parameter settings. In the case of

Communal Sharing, who counts as a member of the in-group is parametric. In the case of Authority Ranking, it is who enjoys a privileged or a lower position. In the case of Market Pricing, it is what counts as a unit of utility.

In both Chomskian linguistics and relational models theory, there are various innate options requiring external triggering (culture) to receive a determinate setting. Just as Chomsky considers universal grammar and internal language to be the proper objects of linguistic study, so Fiske's approach, if further developed, could come to focus on, in addition to the four models, *internal morality* as its object, i.e. the mental representations of the models along with their parameter settings in the individual (5). This internal morality could also be described as a state of a particular moral faculty at some stage of maturation.

Principles, Parameters, Pluralism

If true, Fiske's theory would imply the two descriptive assumptions of pluralism, namely that there is moral diversity, and that there is, in at least some cases, no universally recognizably reasonable method for resolving such diversity. Such a dispute would be like Turkish speakers saying that Spanish is wrong. On Fiske's view, people in different cultures, people with different individual histories, will often have incompatible moral intuitions due to having internalized different implementation rules. In some, indeed many, cases, there would be no method which all could agree on as reasonable for resolving the resultant moral disputes.

But relational models theory tends to militate against relativism. As evidence for his view, Fiske notes that people in all cultures can understand the four models, everyone can see how someone could be motivated by any one of them. This is so, even though many are quite happy that they do not apply all of the models, e.g. foragers are happy not to apply Market Pricing and tend to view those who do with some contempt, but they have no trouble

understanding the essential concept of Market Pricing. During the Cold War, many North Americans viewed the Soviet Union as a naïve attempt to overextend the Communal Sharing model, an attempt perhaps involving extreme hypocrisy; but those same North Americans could still understand why someone might want to try extending Communal Sharing to the economy of an entire nation. On Fiske's view, since the four models are biologically innate, they are universal. This does not mean that everyone applies them, but that everyone has the capacity to apply them and can understand the motivation for applying any one of them. This is incompatible with relativism. The relativist claims that people sometimes fail to see anything compelling in each other's values. There is nothing they can say to each other by means of persuasion, rational or emotional. One can accept the fact that there are differences, use threats or rewards to try to get the other to change, or try to find some causal explanation of the difference. But each sees no persuasive force in the other's values.

Relational models theory implies a conception of morality very near to Berlin's pluralism, what I have been calling "mere pluralism": "We are free to criticize the values of other cultures, to condemn them, but we cannot pretend not to understand them at all, or to regard them simply as subjective, the products of creatures in different circumstances with different tastes from our own, which do not speak to us at all" (1990: 11). If relational models theory is correct, not only are social structures and social ideals explicable in terms of recognizable models, but the principles of composition and recursion whereby a complex structure or ideal is created are also universally familiar by virtue of being innate.

In order to test relational models theory, Fiske and his colleagues performed a number of studies some of which examined involuntarily calling or referring to someone by the wrong name (Fiske, Haslam, and S. T. Fiske, 1991). Fiske et al. were concerned to show that the relational models are a better predictor of such mistakes than are other ways of categorizing one's

acquaintances, such as personality, ethnicity, and age. They also studied person memory errors in which one incorrectly remembers with whom one did something and misdirected actions in which one performs an action with a person other than the one intended, e.g. placing a glass of milk by the wrong child's plate. In each case, they predicted that mistakes would generally occur "within mode," i.e. that the relational models would tend to predict the mistakes. Nine such studies were conducted across different cultures (Fiske, Haslam, and S. T. Fiske, 1991; Fiske 1993). Fiske found that, with the exception of gender, the four relational models were better predictors of such errors than were other categories. People's deliberate substitutions, e.g. changing one's mind about the person with whom one will perform an activity, such as going to see a film, also support the relational models theory (Fiske and Haslam, 1997).

Fiske's view also shows that the principles which underlie moral competence need not be principles in the moral sense, e.g. Brandt's basic moral principles. A universal psychological structure underlying moral competence, considered just by itself, may not count as an axiom from which moral conclusions can be drawn (but for a contrary view, see suggestions by John Mikhail discussed in Harman 2000: 224-25). Equality Matching, for example, only generates moral principles when taken in conjunction with learned information, e.g. which contexts to apply it to, and rules of implementation. The model's being universal does not mean that there are any universally held moral principles. In other words, it does not imply absolutism.

Earlier it was noted that a single individual, in practically all normal cases, knows and uses more than one internal language, utilizing a different internal language in different contexts, e.g. with different conversational partners. This means that each of us is, despite commonsense assumptions to the contrary, multilingual. Similarities between internal language and internal morality lead one to ask whether each of us is also multi-moral, having different moral intuitions

in different contexts even relative to the same moral questions. If this internal multi-morality involves irresolvable value conflicts, then it would be a kind of pluralism.

Psychological studies show that anticipating interaction with one conversational partner can bias one's normative judgments in the direction of what one takes the other's values to be, while anticipating an interaction with another conversational partner at some other point in time could bias one's judgments in some very different direction (Chen, Shechter and Chaiken, 1996; Lundgren and Prislin, 1998). This is roughly similar to the linguistic contextual adaptability discussed earlier. Can one speak of the person as being multi-moral in analogy to how each of us is multilingual? Isn't it more accurate to say that people can sometimes be persuaded, in non-rational ways, to change their minds? The question is whether finding oneself pulled in one direction in anticipation of a conversation with one person, on the assumption that one is motivated to get along in a friendly way, and then finding oneself pulled in another direction in anticipation of an interaction with someone else could lead to ambivalence. Commonsensically, the answer would seem to be that it can. If the individual is not aware of any method which strikes him or her as reasonable for resolving this ambivalence, then one has a kind of pluralism even within a single individual. Hence, there may be some grounds in support of Gilbert Harman's speculation that "As with [internal languages], individuals often have available several [internal moralities], sometimes one applying at home, another at work; one with old school mates, another with new friends. There may even be moral 'bimorals' who possess two different [internal moralities] – the moral version of bilinguals" (2000: 222-23).

It may be worthwhile to recall the point of this lengthy comparison of linguistic diversity and moral diversity. The point was to show that moral nativism, the view that there are biologically innate universals underlying moral cognition, does not automatically refute the pluralist claim that moral diversity sometimes cannot be resolved in a rationally satisfying way.

In fact, it is quite possible that moral nativism shows us *how there can be* conflicting moral intuitions for different people, or even for a single person, with no satisfying means of resolution. P&P in language, and the consequent proliferation of internal languages, provides a model for understanding how there can be proliferation of incompatible moral systems, all causally depending on the same repertoire of innate models, but each with its own implementation rules.

But is morality relevantly similar to language here? Are moral intuitions the result of mental representations with a P&P structure? It is time to consider a possible alternative.

Uneven Progress

Peter Kropotkin suggested a different approach to understanding the psychology of moral diversity, an approach suggesting absolutism rather than pluralism:

It is utterly impossible to divide this instinct [for altruism] from the influence of reason. With the help of reason we create out of our innate feelings and tendencies that which we call moral conceptions, so that the moral element in man is at once inherent and the product of [cultural] evolution. We come into this world as beings already endowed with the rudiments of morality; but we can become moral men only through the development of our moral rudiments. Moral tendencies are also observed among social animals, but morality as the joint product of instinct, feeling, and reason, exists only in man. *It developed gradually, it is developing now, and will continue to grow – which circumstance accounts for the difference in moral conceptions among different peoples at different periods.* This variation led some light-minded negators of morality to conclude that morality is something conditional, having no positive bases in human nature or human reason. (1993: 252; italics added)

That is, we have innate knowledge of some very basic notions of right and wrong. With the help of reason, we can develop these basics to produce more sophisticated and satisfying notions. The uneven development of this process explains much of the world's moral diversity. Those who

are behind in their moral conceptions can be shown, by an appeal to reason, that the more advanced conceptions are better.

The above is, at best, only the barest outline of a theory. One would like to have a better grasp of what the expressions “rudiments of morality” and “reason” mean. We have already noted that the ability to apply recursive procedures is necessary in order to account for the unboundedness of moral judgment. This should, then, be at least part of what we mean by “reason” in referring to the application of reason to “rudiments of morality,” viz. the application of recursive procedures to mental representations of social situations. Fiske’s relational models are susceptible to recursion and composition, as shall be discussed shortly; but there seems to be no room for the notion of progress in Fiske’s relational models account, no room for rational convergence in people’s moral views toward a single ideal system, which is why his account of moral diversity, unlike Kropotkin’s, is pluralist.

There are accounts of some types of cognition in which recursion is an engine of progress without the relativity of parameter settings. To explore this sort of cognition, it is useful to turn away from language and focus on mathematics. The world’s mathematical diversity is different from its linguistic diversity. Languages, at least for many purposes, seem to be equivalent variations on a common, underlying pattern. However, the difference between modern mathematics and, say, ancient Greek mathematics is clearly progress. Recursion plays a role here; mathematical progress requires new, subtle, and ingenious applications of recursive procedures. By looking into the nature of mathematical cognition, we get an idea of how one might put some flesh on the bare skeleton provided by Kropotkin, and thus begin to see an alternative to Fiske’s pluralism. So let’s consider some recent work on mathematical cognition.

There is evidence for an innate number sense which humans share with other primates (Dehaene, 1997). It is a modest endowment compared with the full range of human mathematical

accomplishment: A typical primate can represent number as an approximate magnitude, discriminating quantities more accurately among small numbers and between numbers that are further apart. In addition to this ability, the primate can also distinguish with precision quantities of 1, 2, 3, and perhaps 4. These two capacities are shared by all primates, both infant and adult.

However, there is a crucial difference in a human child's conception of mathematics versus that of a non-human primate. By the time the human child has grasped the first three integers, and possibly also the fourth, s/he realizes that each number has a successor. For a chimpanzee, by contrast, even after years of training, there is no evidence that the chimp understands the open-ended nature of the series of integers. Mathematical progress, beyond the degree of knowledge innately shared by all primates, exhibits unbounded productivity and hence requires the ability to apply recursive operations (Hauser et al., 2002).

There is also controlled empirical evidence suggesting that humans have recursive abilities lacked by other primates. This may mean that humans are capable of types of recursion alien to the minds of non-human primates, or it may simply mean that the human can apply certain sophisticated types of recursion to a wider range of cognitive domains than can other primates even though the other primates may be able to apply these same forms of recursion to some more narrow range of domains. In either case, the evidence suggests a uniquely human capacity. This capacity may tell us something about the nature of moral progress and support absolutism. But before continuing the discussion of moral cognition, we need to say a bit about different forms of recursion and the nature of language.

A very simple sort of recursive grammar is known as a "finite-state grammar" because such a grammar can be realized in a certain sort of machine known as a "finite-state automaton." An example of a finite-state automaton is illustrated in Figure 1. Such a machine is capable of entering into a finite number of states, represented in the figure by numbers. For each state that it

enters, it has a certain probability of writing down a symbol. In the figure, the symbols are the capital letters. The result is that the machine writes a string of symbols, a formula, e.g. NNSG.

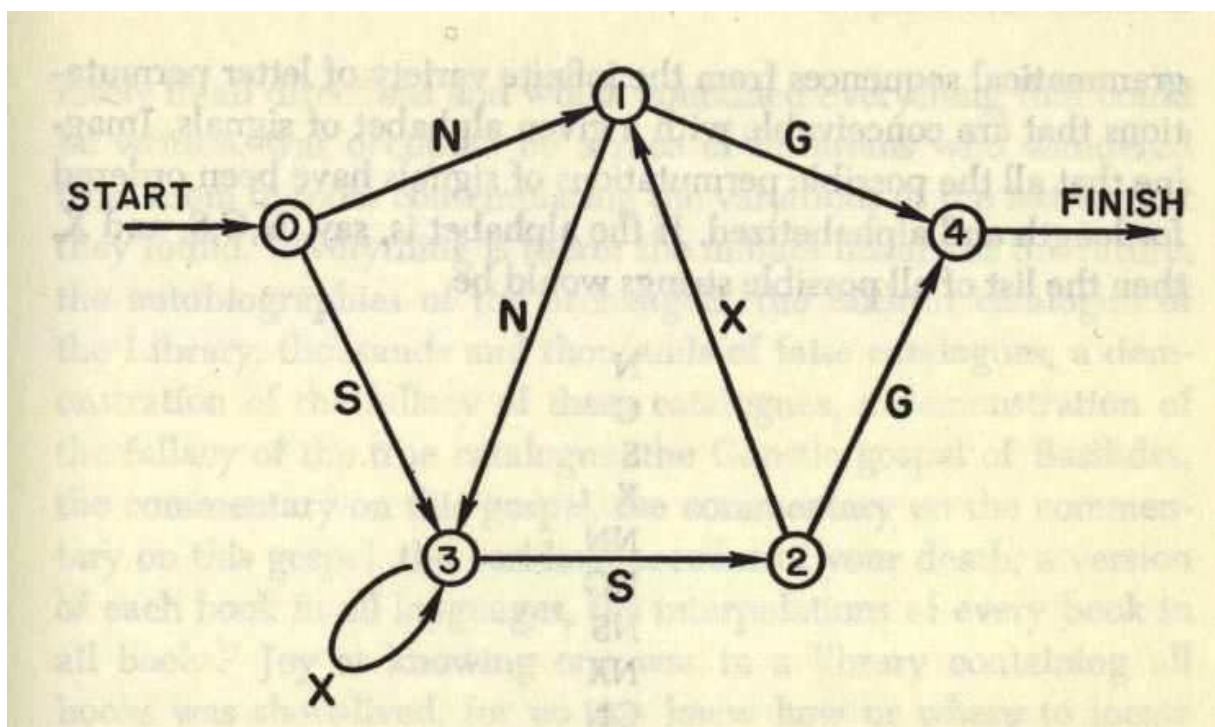


FIGURE 1. Schematic illustration of a finite-state automaton. Numbers represent machine states. Letters represent what the machine inscribes. The machine corresponds to a grammar capable of producing an infinite number of formulae such as SXXSXG. This infinity is owing to iterative recursion but not embedding, and hence cannot do justice to the syntax of any natural language. Reproduced from Miller (1969: 131).

Chomsky devised the notion of a finite-state automaton or grammar to show how hopeless it is for explaining natural-language syntax (1956). We can think of a finite-state automaton as embodying rules for producing sentences. Such rules can be understood as instructions given to an automaton governing its transition from one state to the next. If the automaton is in a state

causing it to write a given symbol, say “The,” then that constrains the range of symbols it could write next: “girl,” “boy,” “man,” or “woman,” among others; but the list would be finite, since the number of states the machine can enter is finite. If the machine writes “woman,” thus giving us “The woman,” that limits the possible symbols which it could write next. And so on, with a rule for stopping at some point. Such an automaton can be either probabilistic or deterministic. (Note that in entering state 3 in Figure 1, there is a certain probability of the machine’s writing either “X” or “S.”)

Although the number of states in a finite-state automaton is finite, there is no limit to the number of formulae it can write. As seen in Figure 1, the machine can go from states 3 to 2 to 1 an unlimited number of times, and so there is no limit to the number of times it may repeat the sequence SXN in writing a formula. Furthermore, once in state 3, there is no limit to the number of times it may write “X.” This capacity for unbounded productivity may give one a certain confidence in the ability of some sufficiently baroque finite-state grammar to produce the sentences of a natural language. One may be tempted to surmise that such an automaton reflects actual operations in the brain.

But there is a problem here, as shown by Chomsky (1956); no finite-state automaton can do justice to the syntax of a natural language. Imagine a grammar capable of producing the following series of strings: AB, AABB, AAABBB, and so on. The rule here is that any number of As must be followed by an equal number of Bs. Other strings are ungrammatical. No finite-state automaton can exemplify this rule. A machine would have to record how many times it had written “A” in order to know how many times to write “B.” This would require an infinite number of states, since there is no limit on how many times “A” can be written. A system with only finitely many possible states could not follow this rule, since it would require the capacity to remember an infinite number of different things. It so happens that this rule reflects the potential

of natural language to produce an unlimited number of parenthetical embeddings: (), (()), ((())), and so on. A finite-state grammar cannot do justice to this common feature of natural language. Nor is any finite-state grammar capable of producing the nested dependencies found in predicate logic. In the sentence “Someone is liked by everyone,” a universal quantifier lies in the scope of an existential quantifier. The ability of the grammar of predicate logic to produce this sort of structure cannot be represented by a finite-state grammar.

One might want to object to Chomsky by pointing out that there are limits on how much recursive embedding a person can process. At least on first hearing, one is stunned by a sentence like “That that that that Jim likes guns is troubling is not surprising is worthy of reflection is pretty likely.” Might these limits show that the grammar represented in the brain is finite-state after all? One must distinguish, however, between the sort of grammar represented in the mind/brain versus limits on one’s memory capacity. The initial puzzlement at such a sentence reflects one’s incapacity to remember all of the elements while first reading it. It does not reflect the nature of the grammar represented.

A phrase-structure grammar, although still not adequate for natural language, is dramatically more powerful than a finite-state grammar. A phrase structure grammar consists of rules indicating the possible structures of a given type of phrase, e.g. that a sentence may consist of a noun phrase and a verb phrase, that a verb phrase may consist of a verb followed by a noun phrase. And so on. A phrase-structure grammar allows for recursive embedding since each phrase can be analyzed into constituent phrases which are themselves further analyzable potentially ad infinitum.

Finite-state grammars require simpler computations than do any type of phrase-structure grammar, since the former are limited to local dependencies. Phrase-structure grammars require greater computational sophistication, namely that the system represent long-distance hierarchical

relations. We can think of various types of grammars as graded in a hierarchy of increasing computational power, namely the power to generate syntactic structures. In this hierarchy, finite-state grammars are found at the bottom. Various types of phrase-structure grammars exhibiting greater generative power and requiring more sophisticated computations are found in a graded hierarchy above the bottom level (Chomsky, 1956).

Learning the rules of a finite-state grammar requires the ability to make certain kinds of statistical inference. Specifically, it requires the ability to compute transitional probabilities: Given the occurrence of one symbol, one needs to be able to compute the probability of the symbol which is likely to appear next. For example, given that “The” was written, one can compute the probability of its being followed by “boy” or by “planet” or whatever.

W. Tecumseh Fitch and Marc Hauser have recently gathered evidence showing that some non-human primates can compute transitional probabilities (2004). Fitch and Hauser tested adult human and tamarin monkeys for their ability to learn finite-state and phrase-structure grammars, specifically their ability to distinguish strings of nonsense syllables which follow a pertinent rule from those violating it. Humans and tamarins could both master finite-state grammars, but only humans could grasp grammars that employ recursive embedding. There are, in fact, many data suggesting that non-human primates are limited in their abilities to master the hierarchical structures necessary for recursive embedding (Spinozzi et al., 1999; Conway and Christiansen, 2001). The matter is still controversial (Bergman et al., 2003; McGonigle et al., 2003) as is the interpretation of Fitch and Hauser’s data (Lieberman, 2004), but there is at least a suggestive hint here as to why human intelligence seems qualitatively different from the forms of intelligence found in other species. More work must be done.

At most, the studies performed by Fitch and Hauser show that tamarins cannot employ recursive embedding in learning the formation rules for strings of syllables. The studies do not

show that other primates are utterly incapable of recursive embedding. Tamarins may apply recursive embedding in some other domain. Hauser, Chomsky, and Fitch consider the possibility that highly dedicated recursion became less dedicated in human evolution (2002: 1578). In other words, sophisticated forms of recursion may perhaps be found in other species, but even so, such recursion will be specialized to some narrow range of cognitive tasks, such as motor tasks. This is why other species, even if they do have some higher-level recursive abilities, are not capable of language. What made language possible, on this hypothesis, is that the ancestors of humans underwent certain cognitive changes whereby higher-level recursion either appeared without precedent or became de-specialized so that it could be applied to conceptual resources in general. This increased ability to apply recursion broadly made possible, not only mathematics beyond the modest number sense, but language too.

Recursion plays a role in relational models theory. The use of Communal Sharing among the Moose of Burkina Faso provides is an example (Fiske 1991: 151). It is similar to self-embedding in language, e.g. the inclusion of a phrase within another of the same type. Among the Moose, one finds one Communal Sharing group embedded within another within another, and so on. A kind of polygamous nuclear family, known as “zaka,” exemplifies Communal Sharing insofar as its members live together, work together, and share resources based on need. That *zaka* lives within a larger group, also known as “zaka,” a compound of several such families living in an enclosure that pools labor and food as needed. These compounds form a larger unit, a kind of neighborhood also united by Communal Sharing, in which various compounds help each other in brewing beer, building houses, and other efforts requiring the resources of a group of this size. These neighborhoods comprise a village behaving collectively with regard to pooling water and to religious rites such as sacrifices. Each level is recognizable as an implementation of Communal Sharing. The maintenance of such a structure requires the ability

to represent it mentally. The human ability to maintain indefinitely many such compound structures shows that recursive embedding plays a role in human social cognition.

We have already noted how humans' expanded recursive ability may be linked to the potential to progress beyond the innate primitives of the number sense to grasp the notion of an unbounded number series and to construct sophisticated mathematical systems. In other words, we have seen how this improved recursive ability may be what makes mathematical progress possible. It may also make moral progress possible by supporting the ability to create social structures and to judge the resulting moral issues. A chimpanzee, for example, may lack the ability to reflect on the sort of multiply embedded social structures described in the two previous paragraphs due to limitations on its ability to embed. This is compatible with Kropotkin's sketch of moral absolutism.

Fiske's account of social cognition is pluralist in that he recognizes how different and even conflicting values may be generated from a finite set of innate models. The plausibility of Fiske's approach, and bear in mind that there is empirical support for his view, helps clear up a misconception about pluralism found in Berlin:

I do believe that there is a plurality of values which men can and do seek, and that these values differ. There is not an infinity of them: the number of human values, of values which I can pursue while maintaining my human semblance, my human character, is finite – let us say 74, or perhaps 122, or 27, but finite, whatever it may be. And the difference this makes is that if a man pursues one of these values, I, who do not, am able to understand why he pursues it or what it would be like, in his circumstances, for me to be induced to pursue it. Hence the possibility of human understanding. (1998: 11)

I do not wish to dispute the remark about human understanding. It is a corollary of relational models theory which, as noted above, enjoys some empirical support. But the remark that human

values must be finite in number is unintentionally comic. Given recursion, one can have potentially infinite productivity given finite means. To admit unbounded productivity is not to deny that there is a finite biologically innate nature common to us all. Nor is it to deny that there are limits on the range of human values. “Infinite” does not mean *all possible*. The set of even numbers is infinite, but it is not the set of all numbers.

That was an attempt to clarify a point about pluralism by appealing to recursion. However, recursion is not proprietary to pluralist approaches, since it is not proprietary to P&P approaches. It is also a property of the absolutist approach to understanding moral diversity, the approach minimally limned by Kropotkin, which I want to turn back to now.

The suggestion I propose, as the second, or absolutist, account of moral diversity, is that the de-specialization of recursion (at least recursive embedding, but perhaps any sort of recursion at all), or its emergence without precedent, also made moral progress possible. This is meant as an absolutist alternative to Fiske’s pluralist approach. On this absolutist approach, we have an innate social intelligence that we largely share with non-human primates (Katz, 2001). However, non-human primate social intelligence is highly restricted in its applications, perhaps due to the fact that embedding operations, or at least the more complex ones, cannot be socially applied by other species. However, once recursive embedding became socially available, we, or our humanish ancestors, developed the ability to apply principles of social intelligence to a potentially unlimited range of situation types. Our social intelligence became creative; we could apply innate moral knowledge to novel problems. This made it possible for us to create forms of society beyond that of foraging, and it also made possible moral progress in all its forms: religious teachings, moral philosophy, and literary meditations on social and interpersonal issues.

When one considers that higher-level recursion is an important tool of reason, one can begin to see what it might mean to say, as Kropotkin did, that reason operates on the rudiments of

morality to achieve moral progress: Innate universals of social intelligence take the form in the individual of a grammar which can be applied to a potentially unlimited number of different types of social situation due to the potentially inexhaustible nature of recursion. This need not assume a P&P approach, which would imply a potential proliferation of distinct internal grammars. The number sense and the cultural evolution of mathematics, for example, do not appear to exhibit this sort of diversity. Moral diversity would instead be explained in the way that mathematical diversity among different cultures is explained: At various points in history, some cultures have discovered subtle and ingenious ways of applying recursive and compositional embedding to the rudiments provided by the innate sense, ways which other cultures had not yet devised. And that point can be made whether “innate sense” refers to the number sense or the moral sense. In other words, as suggested by Kropotkin, different moral conceptions in different cultures would be due to different degrees of moral progress. This is not to say that later is always better; the possibility of moral decline remains open, just as there can be any sort of cultural decline, including a decline in mathematical knowledge.

A system of rules with recursive properties need not include P&P, as reflected in the fact that recognition of the importance of recursion to linguistic intelligence long predated any discussion of P&P. Mathematical intelligence clearly involves recursion, but there seems to be nothing akin to P&P in the internalized representations which make mathematical reasoning possible, as seen in the fact that mathematical diversity among cultures does not rest on irresolvable disputes. Hence, the appeal to recursion in the absence of P&P represents a distinct approach to moral diversity, one seeing moral diversity as akin to mathematical diversity rather than to linguistic diversity. The point is that absolute, unconditional principles can be applied recursively.

The Varieties of Progress

This absolutist alternative to pluralism, “Kropotkin’s view” as one might call it with only mild anachronism, may seem like elitism, and indeed one charge against the notion of moral progress in favor of pluralism is that the latter is somehow more tolerant or less elitist. One could, I suppose, just bite the bullet and say that some sort of elitism happens to be true: Some cultures are more morally advanced than others. However, I think that the charge of elitism is mitigated by noting an ambiguity in such words as “progress” and “advanced.” Suppose someone were to say that the United States has shown great progress in the advancement of mathematical knowledge thanks to research in American universities, NASA, and so forth. Suppose someone else disagreed, saying that the rate of mathematical illiteracy has risen over the last thirty years in the U.S. -- not progress at all but its opposite. Clearly, these two people would be talking past each other. There is one sense in which the United States has made great mathematical progress and another in which it has declined in its mathematical knowledge.

When Kropotkin speaks of some cultures as being more morally advanced than others, he could mean either of these or both. So even if one culture is more morally advanced than another by reason of containing some philosophers or theologians or poets who have more advanced conceptions of justice or benevolence than does some other culture, this does not mean that an individual selected at random from the former culture will be more morally sophisticated than one chosen at random from the latter. It could still be the other way around. Any claim of one culture’s being superior to the other would have to be qualified by this consideration.

One should also consider the fact that progress need not imply only one dimension. Historically, different cultures progressed in different areas of mathematics. As a result, the interaction between cultures meant that they were often teaching each other. On this second account of moral diversity, one would expect something similar to be the case: different cultures

progressing at different rates on different moral issues. One culture may be more enlightened than another with regard to, say, the treatment of animals while being less enlightened about economic equality.

However, one might still claim that there is elitism here insofar as some people might have more cutting edge knowledge than do others. But then why isn't it elitism to admit that some people have high-level mathematical knowledge which others lack? Rather than elitism, this may be a call for better education – say, having ethics courses in secondary school.

Another relevant point here is that one must distinguish moral knowledge from what one chooses to do with it. This is really just Chomsky's distinction between competence and performance applied to morals. As it was first applied in linguistics, competence is knowledge and understanding of language; performance is what one does with that knowledge and understanding (1965). Performance, for Chomsky at least (1980; 2002), involves free choice in a libertarian or a-causal sense. It is reasonable to suppose that performance in language often involves what one chooses to say and hence that there can be no strictly quantifiable science of performance as there can be of, say, syntactic competence. Hence, Chomsky's efforts at theory have focused wholly on competence. A similar point can be made for moral judgment: Moral judgment or knowledge is distinct from how people choose to act, and so a theory of moral judgment need not be expected to be a theory of behavior or choice. The latter may well be impossible, either because of the extreme complexity of the human mind considered as a whole or for some deep metaphysical reason having to do with the nature of choice and causality.

A possible example of the complexity of the human mind considered as a whole is weakness of will. One must not forget what Plato pointed out long ago, namely that there are other elements to the mind than just the part which generates or recognizes moral value. Human behavior results from complex interactions. Temptation may thwart one's best judgment.

What might stimulate moral progress in the sense of there being at least some individuals in a society who attain a high degree of sophisticated moral conceptions? Well what has stimulated mathematical progress? One factor has been the appearance of new needs, e.g. the need to use fractions in order to devise a better calendar, the need to invent trigonometry for the sake of surveying. I suggest that something similar holds true for moral progress: The appearance of new types of social questions forces people to apply recursion to innate moral representations in new and more subtle ways, e.g. issues raised by cloning, the internet, surveillance, means of tracking identity. This suggests that new technology and new social issues will lead to new moral horizons. However, this does not mean that everyone in society will be enlightened from this moral progress to the same degree, since not everyone will apply themselves as seriously to the new moral questions raised.

Nor does “moral progress” here indicate much about how people will actually behave. In a sense, given its philosophical and literary background, the Third Reich was heir to an impressive degree of moral progress. But that says little about what the Nazis chose to do. One could perhaps speak of “cognitive moral progress” to distinguish the intellectual achievement from the actual improvement of behavior.

Cognitive moral progress is a growth in knowledge. Since it is plausible to assume that ignorance excuses, then, given that there has been cognitive moral progress, one could perhaps excuse someone from, say, owning slaves or eating meat from a factory farm, if they were ignorant of these things’ being wrong. This is one way in which one’s culture, which clearly plays a role in what one knows, can make a difference to one’s culpability. It could explain why we are sometimes right in judging people in different epochs or different cultures differently. This is a kind of relativity, a relativity of culpability. It is worth keeping this kind of relativity in mind when judging people in relation to their influences and access to information, but it is not

the sort of diversity that pluralism implies. The latter is a diversity of moral principles such that one cannot conclusively rank them when they conflict.

The sort of relativity found in uneven moral progress is not like that. Moral progress implies that some principles are clearly better than others. Relativity only enters in insofar as one should judge culpability relative to what the agent can reasonably be expected to know. So it is appropriate to describe Kropotkin's view as an alternative to pluralism. If Kropotkin's view is right, then slavery was wrong, objectively wrong, in the days of Washington and Jefferson, even if they could be excused for owning slaves out of ignorance. (The example is counterfactual, since Washington and Jefferson were aware of moral objections to slavery.)

Is Kropotkin's View Partially True?

So there are two views of moral competence. We may refer to them as "Fiske's view" and "Kropotkin's view," acknowledging that what is essential to Fiske's view, as the term "Fiske's view" is being used here, is that it incorporates P&P thus implying irresolvable moral conflicts. Both views incorporate recursive embedding. Conceivably, there could be other approaches to moral cognition differing from Fiske's relational models theory in that they appeal to mental representations other than the four models, but if they incorporate some version of P&P, then I will, for the sake of convenience, include them as variations of "Fiske's view." It is also understood, as mentioned earlier, that the phrase "Kropotkin's view" is mildly anachronistic, since it refers to a view incorporating ideas from Hauser et al. (2002) in the attempt to put flesh on Kropotkin's notion of reason; but the anachronism seems harmless.

Given the controlled empirical evidence for Fiske's view, should Kropotkin's view be taken seriously at all? Yes. For one thing, the psychological data acquired so far merely show, at best, the psychological reality of the four models. None of the studies mentioned earlier shows

that all possible concatenations of the models are potentially represented in the mind as morally equal. There may be rules of combination for the models of an absolute, non-parametric sort such that some concatenations are better formed than others. Perhaps the extreme reliance on Market Pricing in the West and the extreme reliance on Authority Ranking in India are both examples of poorly formed concatenations and hence are inferior to other possible constructions. There need be nothing paradoxical in finding actual social structures that violate an internalized rule constraining the combinatorial powers of the models. Once again, the distinction between competence and performance is relevant: Just because there is a certain mental representation of social life does not mean that actual social life will always precisely resemble it. Other factors may intervene. One possibility is that large population densities, larger than those found in the human ancestral environment, have forced people to rely on poorly formed concatenations, concatenations which would not be found in small groups. One may have to rely on concatenations which violate some internal principle in order, for example, to coordinate interactions in extremely large groups. Overapplying Market Pricing or Authority Ranking may be a practical necessity and yet, at the same time, deeply morally unsatisfying. If one could find a means of mass coordination which would avoid these concatenations, it would better cohere with our deepest values. This is speculative, but to dismiss it as mere speculation would be to miss the point: The psychological reality of the four models does not rule out there being some unconditional moral principles which are absolute rather than parametric.

Furthermore, there is no reason why one couldn't accept the psychology of relational models as only part of the truth about moral competence. For Chomsky, many linguistic universals exhibit a P&P structure, but not all do. The first linguistic universal mentioned in this paper, namely that all movement is structural, is not parametric. The matter calls for further investigation, but even if the relational models take a P&P form, there may be other mental

representations underlying moral judgment which do not take this form. Perhaps, as noted in the previous paragraph, these principles constrain possible concatenations of models, or perhaps they exist independently and alongside of relational models, e.g. the principle that whatever rule you apply to others you should also apply to yourself. If Fiske's view is only part of the truth about moral cognition, then we may have only a weak pluralism, i.e. a pluralism compatible with the view that there are some moral absolutes. One's moral intuitions in any given situation could be the result of a combination of parametric and non-parametric factors.

Chomsky himself gives little indication of being a pluralist. He is definitely not a strong pluralist. To the contrary, he emphasizes that people tend to converge in their moral judgments in the process of debate (1978: 240-41; 1988a: 152-53). One might infer from this that he expects there to be at least some crucially important universals of social intelligence which will turn out not to be absolute.

Even so, Kropotkin's view of cognitive moral progress differs from Chomsky's conception of the same. One of Chomsky's illustrations of such progress is the 19th-century debate over slavery. That debate was not simply an expression of differing points of view, but was a rational exchange of ideas presupposing many shared assumptions. Each side could admit that the other made good points, e.g. even the pro-slavery side made the valid point that one is usually more concerned for the well being of one's property than for the well being of something one rents (wage slavery, in the case of human beings). In the resolution of that debate, "you see a consciousness emerging of what really is right, which must mean it reflects our built-in conception of what's right" (1998: 1). For Chomsky, dialogue between those who make conflicting moral judgments leads to an appreciation of the moral views they share. It is to gain a conscious awareness of what was hitherto an unconscious moral competence: "It's better to have a conscious understanding of what's guiding you, to the extent you can, than just to react

intuitively, without understanding” (1998: 2). He uses this as grounds for advocating free speech as a means to achieving greater progress.

I think one should be struck by how closely Chomsky’s notion of cognitive moral progress resembles his own work in linguistics. In linguistics in the last forty-five years or so, most of the progress has been made by discovering facts about unconscious syntactic competence, a progress for which Chomsky deserves great credit. But this was progress in *linguistics*, not progress in language. Assuming that it makes sense to speak of progress in language at all, then Shakespeare has done far more to enrich language than has Chomsky. It seems clear that Chomsky has not advanced language but the study of language. Likewise, progress in mathematics does not consist in our discovering the unconscious universals of mathematical competence, but of applying recursion to our innate mathematical knowledge in new and more ingenious ways. The former would be progress in the science of mathematical cognition, not progress in mathematics. It is unclear why greater conscious awareness of hitherto unconscious moral universals would constitute progress in moral knowledge as opposed to progress in our understanding of the cognitive underpinnings of moral judgment. I submit that the view that I have, albeit with mild anachronism, been attributing to Kropotkin is a better conception of cognitive moral progress than the view Chomsky proposes: An essential element of cognitive moral progress is the derivation or construction of principles from our innate moral competence through hitherto undreamt of uses of recursion. In other words, it is analogous to progress in mathematics.

The questions raised here about unconscious moral competence are empirical, and there are empirical approaches to them. This shows that empirical work in cognitive science is relevant to deciding whether or not pluralism is true. Specifically, it is relevant to understanding whether or not moral intuitions result from the sorts of unconscious mental representations which

allow for convergence of judgment in moral debate or whether they are of the parametric sort which would block such a convergence. Of course, representations of both sorts may be at work, in which case cognitive science can throw light on the extent to which weak pluralism is plausible.

Conclusion

The point of this discussion has been to use recent advances in cognitive science to evaluate some of the descriptive assumptions behind relativism, pluralism, and absolutism. The argument for accepting Berlin's distinction between relativism and pluralism, despite the fact that what Berlin means by "pluralism" is what some philosophers mean by "relativism," is that the distinction is valid: There is a difference between finding someone else's values comprehensible as motives or reasons, even though one rejects them, as opposed to finding them incomprehensible or comprehensible merely causally. It is the difference between recognizing a possibility of reasoned discussion versus simply recognizing difference and then having to decide whether to live with that difference or destroy it. The latter possibility, relativism, may exist between different species or between mentally normal people versus psychopaths, but it does not characterize what one normally thinks of as moral diversity. Neither Fiske's view nor Kropotkin's allows for relativism. The upshot of the considerations raised here is that relativism is probably false. The cognitive science of moral judgment does not appear to be advancing in a relativist direction.

Furthermore, the tendency toward convergence in moral dialogue argues for some degree of absolutism. What pluralism there is, is not strong but weak. Hence, Berlin's emphatic plea for pluralism is probably exaggerated. There is, however, some evidence that Berlin's pluralism was weak after all, that he did recognize some absolutes (Galipeau 1994: 65-8, 82). In that case, there

is less disagreement between Berlin and the conclusion reached here, although one would still wonder why Berlin stressed diversity so much.

The present conclusion about pluralism is very near to Brandt's attitude toward what he called "relativism," which was actually just his term for pluralism: "Relativism as an emphasis is misleading, because it draws attention away from the central identities, from widespread agreements on the items we care most about" (quoted in Beauchamp, 1982: 38-9). That remark seems to hold true of pluralism to the extent, if any, that it is true: There are irresolvable moral conflicts, not only between cultures, not only between people, but even within the individual's breast. But to focus too much on these clashes is to overlook the extent to which absolutism is true of the things we care about most.

Many of these conclusions are tentative, but I hope I have at least shown that advances in cognitive science are relevant to deciding how far pluralism or absolutism is true. Parametric structure, which plausibly underlies syntax, gives some idea of how pluralism might be true. The cognitive mechanisms underlying mathematical intelligence give some idea of how far absolutism is right. Advances in cognitive science should help us better understand the extent to which we are inevitably divided and how far we are potentially harmonious in our values.

Notes

- (1) None of the cognitive science appealed to in this paper could be called "sociobiology." The point of the paper is to sketch possible explanations of an aspect of human knowledge, whereas sociobiology undertakes the task of trying to explain behavior. Given that scientists cannot predict the flight path of a bee, the sociobiological task is perhaps unrealistic. Furthermore, along with evolutionary

psychology, sociobiology, prior to empirical testing, tries to infer the existence of certain behavioral tendencies and/or mental faculties by appealing to their usefulness in helping the organism adapt to some ecological niche in the ancestral environment. No such reasoning is appealed to in this paper.

- (2) Chomsky is concerned to understand the unconscious or “tacit” knowledge which underlies our ability to use language. The question is what unconscious inferences the child would have to make. Likewise, the representations underlying syntactic and moral competences are not conscious.
- (3) This is not to say that all languages use movement to form questions. Turkish and Japanese do not. It is to say that movement, when used, is sensitive to parts of speech.
- (4) This universal applies only to basic word order. It is not a counterexample that Dutch and German, although head-first, have head-last verb phrases in subordinate clauses.
- (5) For some speculations outside the framework of Fiske’s relational models theory as to how a P&P approach might apply to moral competence, see (Dwyer, 1999; 2004; Harman, 2000).

References

BEAUCHAMP, TOM L. 1982. *Philosophical Ethics: An Introduction to Moral Philosophy*. New York: McGraw-Hill Publishing Company.

- BERGMAN, THORE J., JACINTA C. BEEHNER, DOROTHY L. CHENEY, and ROBERT M. SEYFARTH. 2003. Hierarchical Classification by Rank and Kinship in Baboons. *Science*. 302: 1234-36.
- BERLIN, ISAIAH. 1990. *The Crooked Timber of Humanity*. Princeton: Princeton University Press.
- _____. 14 May 1998. My Intellectual Path. *The New York Review of Books* 45(8). Available on the internet: <http://www.nybooks.com/articles/13853>. Page references are to the internet edition.
- BRANDT, RICHARD. 1954. *Hopi Ethics: A Theoretical Analysis*. Chicago: University of Chicago Press.
- _____. 1959. *Ethical Theory: The Problems of Normative and Critical Ethics*. Upper Saddle River, New Jersey: Prentice Hall.
- _____. 1968. Ethical Relativism, in Paul Edwards (ed.). *The Encyclopedia of Philosophy*. New York & London: Macmillan & The Free Press.
- _____. 1984. Relativism Refuted?. *The Monist* 67: 297-307.
- CAREY, SUSAN and ROCHEL GELMAN (eds.). 1991. *Epigenesis of Mind: Studies in Biology and Culture*. Hillsdale, New Jersey: Erlbaum.
- CHEN, SERENA, DAVID SHECHTER, and SHELLY CHAIKEN. 1996. Getting at the Truth or Getting Along: Accuracy- Versus Impression-Motivated Heuristic and Systematic Processing. *Journal of Personality and Social Psychology* 71 (2): 262-275.
- CHOMSKY, NOAM. 1956. Three Models for the Description of Language. *IRE Transactions on Information Theory* 2: 113-124.
- _____. 1965. *Aspects of the Theory of Syntax*. Cambridge, Massachusetts: MIT.
- _____. 1971. *Problems of Knowledge and Freedom*. New York: Pantheon.
- _____. 1978. Language Theory and the Theory of Justice, *Linguistic Analysis* 4(4): 301-19. Reprinted in Chomsky 1988b. Page references are to the latter.
- _____. 1980. *Rules and Representations*. Oxford: Blackwell.
- _____. 1981. *Lectures on Government and Binding*. Dordrecht: Foris.
- _____. 1988a. *Language and Problems of Knowledge*. Cambridge, Massachusetts: MIT Press.
- _____. 1988b. *Language and Politics*, edited by C. P. Otero. Montreal and New York: Black Rose Books.
- _____. 1998. Noam Chomsky Interviewed by Tor Wennerberg. *Z Magazine*; available on the internet: www.zmag.org/chomsky/index.cfm
- _____. 2000. *New Horizons in the Study of Language and Mind*. Cambridge: Cambridge University Press.

- _____. 2002. *On Nature and Language*. Cambridge: Cambridge University Press.
- CONWAY, CHRISTOPHER M., and MORTEN H. CHRISTIANSEN. 2001. Sequential Learning in Non-Human Primates. *Trends in Cognitive Science* 5: 539-46.
- DEHAENE, STANISLAS. 1997. *The Number Sense: How the Mind Creates Mathematics*. New York: Oxford University Press.
- DWYER, SUSAN J. 1999. Moral Competence, in Murusagi and Stainton: 169-90.
- _____. 2004. How Good Is the Linguistic Analogy? In progress, available on the internet at www.umbc.edu/philosophy/dwyer/.
- FISKE, ALAN PAGE. 1991. *Structures of Social Life: The Four Elementary Forms of Human Relations*. New York: Free Press.
- _____. 1992. The Four Elementary Forms of Sociality: Framework for a Unified Theory of Social Relations. *Psychological Review* 99: 689-723.
- _____. 1993. Social Errors in Four Cultures: Evidence about Universal Forms of Social Relations. *Journal of Cross-Cultural Psychology* 24: 463-94.
- FISKE, ALAN PAGE and NICK HASLAM. 1997. The Structure of Social Substitutions: A Test of Relational Models Theory. *European Journal of Social Psychology* 27: 725-29.
- FISKE, ALAN PAGE, NICK HASLAM, and SUSAN T. FISKE. 1991. Confusing One Person with Another: What Errors Reveal about the Elementary Forms of Social Relations. *Journal of Personality and Social Psychology* 60: 656-74.
- FITCH, W. TECUMSEH, and MARC D. HAUSER. 2004. Computational Constraints on Syntactic Processing in a Nonhuman Primate *Science* 303:377-80.
- GALIPEAU, CLAUDE. 1994. *Isaiah Berlin's Liberalism*. Oxford: Oxford University Press.
- HARMAN, GILBERT. 2000. *Explaining Value, and Other Essays in Moral Philosophy*. Oxford: Oxford University Press.
- HASLAM, NICK. 1994. Mental Representation of Social Relationships: Dimensions, Laws, or Categories? *Journal of Personality and Social Psychology* 67: 575-84.
- HAUSER, MARC D., NOAM CHOMSKY, and W. TECUMSEH FITCH. 2002. The Faculty of Language: What Is It, Who Has It, and How Did It Evolve? *Science* 298: 1569-1579.
- HIRSCHFELD, LAWRENCE A. and SUSAN A. GELMAN (eds.). 1994. *Mapping the Mind: Domain Specificity in Cognition and Culture*.

- Cambridge: Cambridge University Press.
- KATZ, LEONARD D. (ed.). 2001. *Evolutionary Origins of Morality: Cross-Disciplinary Perspectives*. Thorverton, UK: Imprint Academic.
- KROPOTKIN, PETER. 1993. *Ethics: Origin and Development*. Bristol, England: Thoemmes Press. First published in 1924.
- LAURENCE, STEPHEN and ERIC MARGOLIS. 2001. The Poverty of the Stimulus Argument. *British Journal for the Philosophy of Science* 52: 217-76.
- LEPORE, ERNEST and ZENON PYLYSHYN. 1999. *What Is Cognitive Science?* Oxford: Blackwell.
- LEVY, NEIL. 2003. Descriptive Relativism: Assessing the Evidence. *The Journal of Value Inquiry* 37 (2): 165-77.
- LIBERMAN, MARK. 2004. Hi Lo Hi Lo, It's off to Formal Language Theory We Go. Unpublished remarks available on the internet at itre.cis.upenn.edu/~myl/language-log/archives/000355.html.
- LUNDGREN, SR, and PRISLIN, R. 1998. Motivated Cognitive Processing and Attitude Change. *Personality and Social Psychology Bulletin* 24: 715-26.
- LYONS, JOHN. 1991. *Chomsky*. 3rd edition. London: Fontana.
- MCGILVRAY, JAMES. 1999. *Chomsky: Language, Mind, and Politics*. Cambridge: Polity.
- MCGINN, COLIN. 1997. *Ethics, Evil and Fiction*. Oxford: Clarendon.
- McGONIGLE, BRENDAN, MARGARET CHALMERS, and ANTHONY DICKINSON. 2003. Concurrent Disjoint and Reciprocal Classification by Cebus Apella in Seriation Tasks: Evidence for Hierarchical Organization. *Animal Cognition* 6: 185-97.
- MILLER, GEORGE A. 1969. *The Psychology of Communication*. Baltimore, Maryland: Pelican. First published in 1967.
- MOORE, GEORGE EDWARD. 1903. *Principia Ethica*. Cambridge: Cambridge University Press.
- MURUSAGI, KUMIKO and ROBERT STAINTON (eds.). 1999. *Philosophy and Linguistics*. Boulder, Colorado: Westview Press.
- PREMACK, DAVID. 1990. The Infant's Theory of Self-Propelled Objects, *Cognition* 36:1-16.
- PREMACK, DAVID and ANN JAMES PREMACK. 1994. Moral Belief: Form Versus Content, in Hirschfeld and Gelman: 149-68.
- RAWLS, JOHN. 1972. *A Theory of Justice*. Oxford: Clarendon; Cambridge, Massachusetts: Harvard University Press.
- SMITH, NEIL. 1999. *Chomsky: Ideas and Ideals*. Cambridge: Cambridge University Press.

- SPINOZZI, GIOVANNI, FRANCESCO NATALE, JONAS LANGER, and
KAREN E. BRAKKE. 1999. Spontaneous Class Grouping Behavior by
Bonobos (*Pan Paniscus*) and Common Chimpanzees (*P. Troglodytes*).
Animal Cognition 2: 157-70.
- STROMSWOLD, KARIN. 1999. Cognitive and Neural Aspects of Language
Acquisition, in Lepore and Pylyshyn (eds.): 356-400.
- WEISS, MICHAEL J. SALOMON and PHILIP ZELAZO (eds.). 1991.
*Newborn Attention: Biological Constraints and the Influence of
Experience*. Norwood, New Jersey: Ablex.