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Language and human behavior

Derek Bickerton

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The Jessie and John Danz Lectures

In October 1961, Mr. John Danz, a Seattle pioneer, and his wife, Jessie Danz, made a substantial gift to the University of Washington to establish a perpetual fund to provide income to be used to bring to the University of Washington each year "distinguished scholars of national and international reputation who have concerned themselves with the impact of science and philosophy on man's perception of a rational universe." The fund established by Mr. and Mrs. Danz is now known as the Jessie and John Danz Fund, and the scholars brought to the University under its provisions are known as Jessie and John Danz Lecturers or Professors.

Mr. Danz wisely left to the Board of Regents of the University of Washington the identification of the special fields in science, philosophy, and other disciplines in which lectureships may be established. His major concern and interest were that the fund would enable the University of Washington to bring to the campus some of the truly great scholars and thinkers of the world.

Mr. Danz authorized the Regents to expend a portion of the income from the fund to purchase special collections of books, documents, and other scholarly materials needed to reinforce the effectiveness of the extraordinary lectureships and professorships. The terms of the gift also provided for the publication and dissemination, when this seems appropriate, of the lectures given by the Jessie and John Danz Lecturers.

Through this book, therefore, another Jessie and John Danz Lecturer speaks to the people and scholars of the world, as he has spoken to his audiences at the University of Washington and in the Pacific Northwest community.

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As for the contribution of my wife Yvonne, I shall say nothing, since no words of mine could adequately convey the depth or the breadth of my indebtedness to her.

Language and human behavior

Introduction

The material on which this book is based was first presented in three public lectures at the University of Washington under the sponsorship of the Jessie and John Danz Fund. In inaugurating the Danz lecture series, the principal motive of its founder and benefactor John Danz was to bring to the university scholars who had "concerned themselves with the impact of science and philosophy on man's perception of a rational universe." When Danz spoke of a "rational universe," what did he have in mind? Surely no more (and no less!) than a universe that is lawful, about which we can make significant generalizations that hold over broad domains, and in which, if one selects an appropriate level of abstraction, the purely contingent has no role to play.

Assumptions of this nature are routinely made in the physical sciences—made without needing to be stated—for no science is possible otherwise. But those assumptions are not always made, or held to, in the behavioral sciences. When humans study themselves, they often hold the view that different rules apply, or that they are somehow exempt from the lawfulness that governs other forms of matter.

I feel that John Danz would have rejected such a view, and would have been absolutely right to do so. And yet one has to admit that those sciences that have tried to account rationally for human behavior have come nowhere near equaling the achievements of the physical sciences. The physical sciences have given us penetrating insights into the nature of matter and have even dared to suggest how matter came into existence. They have done a much better job of describing the material universe than literature has. Yet despite much effort on the part of the behavioral sciences, we still, in words cited approvingly by a previous Danz lecturer (Alexander 1979:ix), "don't know who we are, or where we came from, or what we have done, or why." If we want to obtain a glimmering of what human nature is like, we are still on firmer ground with Shakespeare or Aeschylus or Joyce or Dostoyevsky than with any behavioral scientist.

There is a more concrete dimension to this contrast. While the link between theoretical concepts and practical achievements is by no means always as tight as it appears, such achievements do give a sense of confidence that the theories supporting them must be heading in the right direction. The physical sciences can show an abundance of this kind

of support: thanks to their discoveries we can communicate instantly around the globe, circumnavigate it in a matter of hours, even leave it altogether for longer and longer periods.

Compared to this, how dismal is our record in the behavioral domain! It would be bad enough to have to confess that most problems of human behavior are never solved, despite the myriad solutions proposed for them. It is worse to have to admit that many of those problems, far from being ameliorated, become more and more intractable with the passage of time. As our physical control over matter tightens, our ability to control ourselves seems to diminish. Economists can't predict slumps, sociologists can't prevent or even explain burgeoning crime and drug abuse, psychiatrists can't cure patients any faster than time, unaided, can do the job, and the unending cycles of famine, destitution, injustice, and violence continue to repeat themselves, intensified rather than diminished despite recent claims of an imminent "end of history."

Alibis are, of course, continually being offered. The behavioral sciences have not been around as long as the physical sciences (but that shouldn't matter, since most of the scientists who ever lived are living now). Humans are more difficult to investigate than matter (but the only tangible evidence for this is precisely that failure to achieve results which constitutes the datum to be explained!). Worst of all alibis, humans are perceived as something special, intrinsically unknowable, having somehow fallen outside the envelope of lawfulness that embraces everything else. Human culture, we are sometimes told, has liberated us from biological constraints; we are free to become gods, if we choose (Stenger 1988). We can do anything and everything except explain what we are and why we are what we are, for that cannot be explained—what we are is simply what we choose to be. Those who assure us of such things seldom draw the obvious conclusion: if what they say were true, we would be faced with the bizarre paradox that so-called rational beings represent the only element of unreason in an otherwise rational universe!¹

Small wonder that some have fled to the opposite extreme and claimed that laws applicable to other species exhaustively account for human behavior. The sociobiologists who have spearheaded this movement have

1. For an insightful discussion of some approaches that place humans above natural law, see Midgley (1985).

not been cautious in their predictions of what such an approach might achieve: according to Edward Wilson (1975:574–75), by the end of the twenty-first century, "biology should be at its peak, with the social sciences maturing rapidly. . . . Having cannibalized psychology, the new neurobiology will yield an enduring set of first principles for sociology. . . . Skinner's dream of a culture predesigned for happiness will surely have to wait for the new neurobiology." Essentially the sociobiological program for studying human behavior involves taking the biological imperatives that govern animals in general, showing how those imperatives continue to manifest themselves in our species despite the sometimes camouflaging effects of culture, and (hopefully) then demonstrating the neurological bases of the behaviors that result. In the words of a recent attempt to execute this program (Ridley 1993:4), "there is nothing in our natures that was not carefully 'chosen' . . . for its ability to contribute to eventual reproductive success."

It is perhaps not unfair to say that this approach can tell us all we need to know about the least interesting aspects of human behavior. For surely what is most interesting about human behavior (certainly the most essential, if we are to understand our true nature, and our relationship with the rest of nature) is precisely the part of it that we do *not* share with other creatures. Indeed, the core of the whole problem of human nature lies in the following paradox: humans are a species produced like all other species by the natural workings of biological evolution, yet the behavior of humans differs dramatically from that of all other species over a wide variety of parameters.

It is fashionable in some circles to deny this, to claim that we are just another species, that our uniqueness merely reflects the fact that all species are unique.² Attitudes of such apparent modesty tend to receive approval when contrasted with the "crown of creation/masters of the universe" bombast common earlier this century (and not entirely extinguished); indeed, it is to precisely such bombast that the "just another species" gambit forms an understandable reaction. But that gambit looks somewhat less attractive in the context of the present plight of nature. What other "unique species" has already decimated the global ecology and threatens to remove 25 to 30 percent of existing species within the

2. The title "Another Unique Species" was used for what is in fact one of the more illuminating recent studies in paleoanthropology (Foley 1987).

next few decades if left unchecked? (Wilson 1992). What other “unique species” stands ready to contaminate other planets with its unique peculiarities? For better or worse (and you may well conclude for worse) our species possesses not merely powers many orders of magnitude greater than those of other creatures, but powers that differ radically *in kind*—powers wholly without precedent in the evolutionary history of earth. In these circumstances, to persist in claiming that we are just another species is not just hypocrisy: it is irresponsibility.

Moreover, the claim that we are just another species ignores the range as well as the power of human behavior. The range of behavior in other creatures does not extend much beyond seeking food, seeking sex, rearing and protecting young, resisting predation, grooming, fighting rivals, exploring and defending territory, and unstructured play. Human beings do all of these things, of course, but they also do math, tap dance, engage in commerce, build boats, play chess, invent novel artifacts, drive vehicles, litigate, draw representationally, and do countless other things that no other species ever did. Any theory that would account for human behavior has to explain why the behavior of all other species is, relatively speaking, so limited, while that of one single species should be so broad. Why is there not a continuum of behaviors, growing gradually from amoeba to human? Why don't chimpanzees build boats, why can't orangutans tap dance?

No extant theory of human behavior can explain these anomalies. Even when they are acknowledged, the things that mark us off from other species are renamed, rather than explained. Our distinctive features are said to result from our great intelligence, our unique cognitive capacities, our consciousness, the complexity of our brains, and so on and so forth. This is like saying our water glass is full because there's a lot of H₂O in it. How did we achieve our level of intelligence, how did we arrive at consciousness, what made our brains so complex, and why should that complexity endow us with consciousness, intelligence, and unprecedented power over nature? Why should our behavior differ from that of other species in so many ways? We cannot provide satisfactory answers for any of these questions. We lack even a basic understanding of the most fundamental factors that make a human being human.

Suppose, however, that these deficiencies in the behavioral sciences stem not from the short time that those sciences have had to develop,

nor from the difficulty of the problems they face, nor from the intrinsic lawlessness of human nature, nor from any of the other causes that have so far been suggested. Suppose that the behavioral sciences have failed to achieve their larger objectives simply because they started in the wrong places and made the wrong assumptions. Suppose that some single characteristic of humans turns out to be the antecedent of most or even all of the other characteristics that differentiate us even from our closest relatives among the apes. If this were so, the reasons for the confusion I have described would be plain enough. We would have failed to provide an adequate explanation of our species simply because we tried to examine each of that species' distinctive attributes as if they were separate and wholly unrelated traits, rather than logical entailments of some single determining capacity.

In this book, language is proposed as just such a capacity. The first chapter examines language and its defining properties, distinguishing them from other forms of communication and indicating their most probable source. The second chapter shows how the capacity for language evolved as the end product of tendencies long latent in what are sometimes termed “more advanced” creatures, and how by the very nature of its evolution language created the ground on which subsequent mental developments could (perhaps had to) arise. The third chapter proposes that the peculiar properties of a distinctively human intelligence are such as derive straightforwardly from the possession of language. Finally, the fourth chapter suggests that consciousness as we know it may arise from an identical source.

Such a program will undoubtedly meet with resistance. Some may well dismiss it as reductionist, forgetting that most improvements in our understanding of nature have come about through some form of reductionism. But reductionism has become a dirty word in the context of the human species. Like some wealthy patient of a Viennese psychiatrist at the turn of the last century, we feel flattered by the thought that we are really very complex creatures, with layer upon layer of fascinating mystery surrounding us—mystery that requires patient unraveling in an awed hush of self-reverence.

Some may even fear that to reduce our specialness to a single attribute might demean us, even license a more contemptuous attitude to humans and their creations than has hitherto existed. After all, if we are merely apes that happen to be able to talk, what are our achievements worth,

what objective value can be placed on individual human lives? But if such fears exist, they are surely misplaced. The concepts of human superiority current over the last couple of centuries did not prevent the extermination of Jews and Gypsies in Germany, of kulaks in the Soviet Union, or of indigenous peoples in the Americas and elsewhere. Indeed, anyone looking at conditions in the world today may well wonder how any change in our beliefs about ourselves could make matters worse than they are now.

In fact the era of the most wildly inflated beliefs in human supremacy has also been the era of the most cynical and egregious crimes against humanity. So striking is this coincidence, one is tempted to propose an exactly contrary theme: an inflated concept of human nature is precisely what licenses such crimes. For the justification of those crimes has always consisted in identifying the perpetrators as the true heirs to this miraculous human heritage, and the victims as subhuman obstacles to the perpetrators' purposes. Perhaps our conduct toward others of our own species (not to mention other species) might be improved rather than worsened by a little humility. Perhaps if we woke to find ourselves all together on the same low plateau, one bare and precarious step above the chimpanzee, some of this lethal vainglory might evaporate.

What might at first seem a more logical objection to the program proposed here lies in the belief, so widespread in the behavioral sciences, that language is simply a means of communication, one of the many skills that our huge brains have allowed us to master. So potent is this misconception, and so little combated by those professional linguists whose duty should be to challenge it at every turn, that it has seduced many of the best minds in a wide range of disciplines. For example, biologist J. Z. Young finds it "rather perverse not to consider human spoken or written language as primarily a functional system evolved for communication" (1978:175). Similarly, philosopher Patricia Churchland says: "Language is a social art, and linguistic behavior serves a communicative function" (1986:388). And in the same vein Eric Newell, leading theorist in computer science and artificial intelligence, opines: "[L]anguage is patently a skill. . . . A fortiori, language will be dealt with [in devising a model of human cognition, DB] from a functional standpoint. . . . It is easy enough to denote the overall function as communication" (1990:441). Such quotations could be multiplied ad nauseam.

If one envisages language as no more than a skill used to express and communicate the products of human thought, it becomes ipso facto impossible to regard language as the Rubicon that divides us from other species. A quite different scenario then seems inescapable—a scenario whose superficial plausibility has already endeared it to several generations in the behavioral sciences, and which is well summarized by Nadeau (1991:173): "The evolutionary success of our species is commonly expressed in terms of our larger brain size. . . . [B]rain size . . . became an evolutionary advantage at the point at which the excess neuronal capacity allowed us to invent a new tool. . . . *Homo habilis* may have been the first of our ancestors with enough excess neuronal organization, or hardware, to invent the first rudimentary elements of human language. . . . During the million-year transition from *Homo habilis* to *erectus*, the neocortex, which became the principal center for association and thought, more than doubled in size."

Paleoanthropologist Philip Tobias (1971:xi) put it rather more succinctly: "increase in brain size = gain in neuronal organization = rise in complexity of nervous function = even more diversified and complicated behavioral responses = progressively amplified and enhanced cultural manifestations." Or in other words, "Tools, hunting, fire, complex social life, speech, the human way and the brain evolved together to produce ancient man of the genus *Homo*" (Washburn 1960).

But this scenario and these equations are not just grossly simplistic. They run dead counter to the empirical data given us by the fossil record itself, the lithic bible on which all these exegeses are supposed to be based! Incredible though it must seem, some of the most salient and widely known facts about the course of development followed by our species are wholly at variance with such a view of things. How fact and interpretation in paleoanthropology have managed to remain disjoint is a question for future historians of science, and will not be broached in these pages. Documenting the existence of this still unacknowledged conflict, together with its nature and extent, will form a topic for the second chapter in this book.

Before that issue can be taken up, however, a more pressing concern must be dealt with. This is a book about language and the logical consequences of the possession of language, for any species (un?)fortunate enough to possess it. But such a book cannot hope to convince its readers

unless it clearly sets forth exactly what language is (a task that linguists have very often been accused, not wholly without justice, of shirking). If language is not simply a skill or simply a means of communication, what exactly is it?

What language is

The term *language* has been put to a variety of uses, or misuses. We hear about the language of flowers or body language; people speak of animal language or the language of bees.¹ Because so many people confuse language with communication, pretty well anything that communicates may be called a language. Such usages have contributed to a widespread misunderstanding of the role of language in human behavior.

The misunderstanding is twofold. First, there is the persistent confusion between a thing and the uses of a thing. This should not be a problem at all. People who blithely say "Language is (a form of) communication" do not confuse cars with driving, scissors with cutting, or forks with eating. If language were a visible tool that you physically used, the confusion could hardly arise. But language is more abstract than cars or scissors, and when thing and use are both abstract the absurdity of conflating them becomes less apparent. Given the object-use distinction, nonhuman communication systems are not communication, either. Nor, for that matter, are body language, the language of flowers, and so on. Like language, they are representational systems used for communication.

The second part of the misunderstanding arises because animal communication systems,² and all the other things illegitimately described as languages, differ from language in that they can do nothing but communicate. Language has additional capabilities, and subsequent chapters will show some of the ways it is used to store information or carry out thought processes.³ These by no means exhaust its functions. But one

1. This abuse is not confined to the term *language* itself, but extends to the subcomponents of language. Thus, in a recent work on language and evolution (Gibson and Ingold 1993), we hear about "auditory syntactic capacities" and "the syntax of performance." It should be clear that hearing has nothing to do with syntax, and that to use "syntax" as a descriptor for any serial process simply deprives the term of any useful meaning.

2. Strictly speaking, I suppose one should say "nonhuman communication systems," since humans are, of course, animals. However, the term *animal communication system* is widely used and understood, and has the advantage that it excludes purely mechanical systems (traffic signals, systems incorporated in robots, and the like) which one would prefer to exclude.

3. This latter procedure has sometimes been pulled kicking and screaming under the communication blanket by the claim that thinking is communicating with

cannot think in body language, or use an animal communication system to store information. If something can be used for only one thing, it is easier to confuse use and thing. The unconscious thought process evolves as follows: animal communication systems are equated with communication, and then language is equated with animal communication systems. So by simple transitivity the solecism "language equals communication" gets committed.

What can different representational systems represent?

The fact that both language and animal communication systems are representational does not mean that they must be accepted as members of the same class. Even from the viewpoint of communication, they differ with respect to what they can communicate and how they communicate it.

Just what kinds of information can be conveyed by nonlinguistic systems? In what is known as *body language*, a person can convey interest in another by body posture, turning or leaning attentively before the object of attention; by direction and intensity of gaze; by spreading arms or legs in a gesture that signifies openness; and by a variety of other subtle means. Similarly, disinterest can be conveyed by a turning away of the body, a closure of the limbs, a dull or distracted gaze, and so on. But one cannot, in this medium, indicate one's profession, one's income, one's interests, or one's taste in wine. This so-called language can convey information about states, conditions, or feelings, but cannot convey much in the way of factual information about objective features of the world.

Interestingly enough, *body language* as used by humans suffers the same limitations as "*animal languages*." The latter, with few apparent exceptions, and perhaps no real exceptions, similarly indicate how the animal feels or what the animal wants, but not what the animal knows. Most if not all of these systems have a narrow range of topics: willingness (or otherwise) to mate, willingness (or otherwise) to defend territory, aggression or appeasement directed toward a conspecific, maintenance

oneself! Which fragment of oneself might be communicating with which other fragment is just one of the pseudoquestions which, hopefully, Chapter 4 will dissolve.

of contact with other members of one's group, or alarm calls that warn of the approach of predators.

Alarm calls might, at first blush, be regarded as utterances that convey factual, objective information—"Here comes a predator!"—or even (in more sophisticated species like vervet monkeys) as protowords for the kind of predator to which they are a response. ~~But problems with the concept of meaning make it difficult to know how to interpret alarm calls.~~ There is a world of difference between inferred meaning and intended meaning: between "That cloud means rain" and "The words 'kindly leave' mean 'get the hell out.'" If I say "Kindly leave" then I want you to get out, and I intend you to know that I want you to get out. But the cloud neither wants to rain nor intends you to know that it is going to rain. The use of the word "mean" in both contexts blurs the distinction between a meaning that can be inferred by an observer and a meaning that is intended by an agent (and can, hopefully, be interpreted in the same sense by a recipient). The fact that the second proviso may be lacking emphasizes the difference between these two meanings of "meaning." The cloud can "mean" only if it has an observer, but I can mean in the complete absence of anyone who comprehends my meaning.

So it may well be a mistake to think that a warning cry actually *means* (in the human sense of meaning) "There is a predator approaching." It might simply mean "I am alarmed by a predator approaching." If that were so, then the warning call would be just another case of how-I'm-feeling-right-now. And of course, "I am alarmed by a predator approaching" logically entails "There is a predator approaching."

But this might suggest that animal calls are merely reflex responses, like our own start of surprise at a sudden loud noise. In fact, things turn out to be slightly more complex than that. Cheney and Seyfarth (1990, chap. 5) have shown conclusively that vervet monkeys (along with other species) do not always call when a predator appears, and that the likelihood of their calling will be influenced by contextual factors, such as the presence or absence of close kin. A better or at least a fuller paraphrase might be "I am alarmed by a predator approaching and I feel you should share my alarm." This still would lie firmly within the domain of what-I-feel-or-want rather than what-I-know.

Cheney and Seyfarth themselves go somewhat further, claiming that "monkeys give leopard alarms because they want others to run into

trees" (1990:174). They may be right, but it would not be easy (even for Cheney and Seyfarth, who are old hands at designing ingenious experiments) to design an experiment that would tease apart the meaning they propose from the meaning "I am alarmed by a terrestrial predator and you too should be alarmed." For, given that running up trees is the preferred vervet strategy for avoiding terrestrial predators, and that an isolated vervet, faced with such a predator, will give no alarm call but will run up a tree, we can assume that running up a tree is no more than a response to the presence (whether personally observed or inferred from a call) of a terrestrial predator, and thus one which would occur whether the warning monkey wanted it to or not. The more parsimonious assumption is that only the animal's own state or condition is being conveyed. And in any case, even what-I-want is still very far from what-I-know.

Does the fact that monkeys occasionally give alarm calls when no predator is present constitute evidence for a less parsimonious interpretation? There is considerable if largely anecdotal evidence (see Whiten and Byrne 1988, Byrne and Whiten 1988) to indicate that monkeys will give such calls when they are being attacked by other monkeys or when they wish to keep some tasty morsel of food for themselves. However, there is no indication here that an alarm-sounding monkey specifically wants other monkeys to run up trees. The alarm-sounding monkey merely wants all other monkeys out of its immediate vicinity; its own observations will have sufficed to show it that alarm calls do remove all monkeys from the immediate vicinity of the caller. All we have to assume for this behavior is some degree of volitional control over calling; and we already know that vervets have such control from the fact that they respond differently in the presence or absence of kin.

Thus one cannot conclude that the alarm calls of vervets (or of any other species) convey factual information, even though information may be inferred from them. On the contrary, animal communication systems convey the current state of the sender or try to manipulate the behavior of the receiver. Human language, on the other hand, is not restricted to expressing an individual's wants or feelings, nor to manipulation, although it can and frequently does serve these purposes. It can also convey an infinite amount of information: not just things like phone numbers, professions, or tastes in music or wine, but the (actual) size

of the earth, the (estimated) age of the universe, the basic principles of marketing or mathematics, the habits of the scarab beetle, the behavior of protons, the events that took place in Madrid on May 2, 1808—things that have only the most indirect and tenuous connection, if any, with what the speaker or writer immediately wants or feels.

There might seem to be at least one exception to the generalizations made above about animal communication systems. One such system—that of bees (von Frisch 1967)—does carry factual information regarding direction, distance, and quality of food supplies. However, bees cannot convey any other information, and even information about food is far from complete. When one of von Frisch's assistants placed a food supply in a tower, the bees that found it failed completely in their attempts to explain its whereabouts to colleagues. Bee "space," or rather the kind of space that can be represented in the bee communication systems, is two-dimensional: bees can indicate horizontal but not vertical directions and distances. Now there may be dimensions in the universe about which we cannot speak; but, unlike bees, we can speak about all the dimensions we experience, and even a few that we don't.

It might seem, however, as if bees do breach one limit that otherwise constrains all animal systems: an inability to communicate about anything occurring in the past, the future, or any place other than where sender and receiver currently find themselves. Bee messages refer to objects at some distance from the hive at which those messages are delivered; one might even claim that they refer to events (discoveries of food sources) that are already in the past when the message is given. But these messages are limited to the most recent of such incidents. There is no way a bee can compare the richness of its latest find with that of the source it discovered yesterday, or express a hope that it may find a still richer source tomorrow. Similarly it cannot state that today's source is twice as far from the hive as yesterday's, or some distance to the east of it. The capacity to refer to a past event or a remote place does not entail the complete freedom of movement in time and space that language bestows.

For language, of course, knows no limitations of space or time. Even when merely conveying our wants, needs, and feelings, it does so in a much more sophisticated way than animal communication systems do. Although it is hard to prove, most animals appear to be on the level of what Dennett (1987) would call "first-order intentionality": they have