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Automaticity

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Abstract

A distinction between language and communication is drawn. Some general consequences follow for the study of cognition, deflating to a large extent the controversial aspects of research program in contemporary linguistics. The byproduct turns out to be that we do not have to solve general problems of intentionality in the study of the mind.
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Tradition singles out language as solely human. For a long time almost all believed humans to be the only language users. Now we are in a different position. [1] There is empirical evidence to the effect that non-human animals communicate. We have, more controversially, evidence that some species (probably only some of the great apes) possess some faculty that many do not hesitate to call language. I

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[1] This paper depends directly on what I learned and listened to during the conference whose proceedings the volume contains. I had the luck of speaking towards the end of Mind & World, Durban 2003. I am grateful to all who were there. I learned much from them. Thanks to David Spurrett for the organisation, the environment, and the hospitality provided in all sorts of ways, cognitive and not. Some of the ideas here have been considerably sharpened and improved by my listening to friends and colleagues at the Friday afternoon cognitive meeting, taking place in Durban every week. I apologize if the tone of the paper is very philosophical and will be somewhat obscure to professional linguists. However I am of the view that the philosophy of language and linguistics, integrational and not, will greatly benefit seeing itself in a larger context of scientific comprehension of minds.

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entertain some skepticism about such claims. Skepticism is however not a theory, much less a doctrine. I set myself the task of drawing a distinction, in a spirit of cooperation with all interested parties.

A naturalistic attitude, whichever the details of one's naturalism, tries to see as little as possible sundry in reality. Eschewing plainly religious positions, there is nothing particular about humans to make them the chosen ones. Hence it is a good methodological position to look for as many as possible similarities, gradual transitions, progressive adaptions, and what have you, between the non-human creatures and humans. I take non-human creatures, for the purpose at hand, to include human infants, infants being exactly *infants*: people who do not speak. And here we find indeed much to learn from the study of animal and even robotic communication. In the words of the late Cole Porter, "sentimental centipedes do it", and we found a plethora of cases in which all sorts of organisms, one way or another, are able to transfer information by a variety of means. Monkeys' and birds' calls, bees' dances, and whales' songs are abundant reason to think that communication is:

(i) not particularly dependent on what philosophers call intentionality (an ability to refer) and
(ii) not particularly dependent either upon the specifics of the human language faculty (we have no reason to think that even the best trained ape gets anywhere close to the size of the lexical repertoires of a 10-year old human, even less reason to believe our simian colleagues acquired an argument structure for verbs).

Even assuming I am wholly wrong about animal language skills, I take it to be a plain fact that there is animal communication and that if there is an animal language, this is achieved via painful training while the triggering of the language faculty in humans is virtually effortless, automatic, and not coached by any pedagogical strain. To check this, consider the simple case of acquisition of argument (slots to be filled conceptually, at the very least) for verbs: who has been taught that "give" has a giver, a givee, and a given?

Were this the end of the story our fretting souls would be placated: we just made a mistake stranded by Descartes. It was credible, after him, that anything that would come to resemble languages if produced by non-humans would have been parroting in the strict sense. It would, to use the standard locution, make no sense. Literally it would be noise produced imitating blindly other noise. Alas this is not the case. The monkey alerting her fellow monkeys that the predator is near is not parroting anything. It is making a noise to inform, warn, guide, and so forth. Ditto for the vagaries of what exactly whales are telling each other, quite possibly just calling one another given that they move in rather extended spaces.

But, here comes the rub and the centre of my paper, there remains a serious problem. While we may agree that communication is a widespread phenomenon, human languages retain some puzzling properties not found in all sorts of other communicative devices. Said properties have been and are still perfectly visible to anybody. Natural languages are intricately structured entities, whose structures

cluster around a property which was the object of classic insights (from what we would now call physics, linguistics is a young discipline.) The property is discrete infinity, seldom present in nature. Perhaps the only other case of a discrete infinity system is the natural numbers, which despite their name may be not part of nature after all.

Discrete infinity is infinity because of the capacity of what has it to produce infinitely many sets of objects by composing ad infinitum a finite set of building blocks. Discrete infinity is discrete because of lack of continuity: there are all sorts of six, seven, seventy nine-word sentences while absolutely nothing is a 3.5 words sentence. Note that systems possessing discrete infinity have literally no upper bound: nothing is the longest sentence of any particular language. Reminder: I am here looking at abstract features of a faculty that is implemented by mind or brains, hired, used by all sorts of other systems. It is quite possible that there is a practical upper bound to the length of a sentence. Interestingly it is not set by the language faculty itself but by interacting systems and mechanisms (memory, lungs, social interests, mortality, if the bound is set by the interpretation systems, morphology and long distance anaphora power—this may truly vary from language to language, German likes long sentences more than English, Mandarin even less). Here it is noticeable that discrete infinity is a property of Ω, the sequence of natural numbers. Again there is no largest number and the sequence, itself not finite, is generated by finite means. The analogy is useful in that it indicates that recursion is a crucial feature of the language faculty. The analogy is doubly useful because in both cases we can identify basic elements of the system. The recursive nature of the natural numbers affords us axiomatic systems whose only basis is an arbitrary Ur-element (in the Peano system, 0) and the successor function. Granted, it may not be so easy to identify what the bases of language thus understood are, but that is no reason to not pursue the inquiry into bases and rules, with an aim at generalizing and minimizing as much as possible.

Trying to be faithful to a naturalistic inspiration, we want to look to non-human species, as well as to subsystems of what, informally, we take to be human minds. We look for systems, individuals, species, and subsystems which are recursive. Note that the question is a purely empirical one. We have a given property, fairly well identified. We even know, more or less, how to manufacture an artificial device capable of computing recursive functions. The issue here is whether we have natural entities with this property. Given commonsensical assumptions, human brains are one such natural items. They are not alone in this though. It seems to me that the first sub-personal system that is recursive is our counting faculty, which we share to a limited extent with some apes, and with far stupider chickens. It may not be the only one though. We do have some evidence that navigational systems for individuals that, presumably are dumber and dumber—such as some insects—are recursive in exactly the right way. In a general sense, nothing in these systems seems to be cognitive, if cognition has to do with knowledge. All these systems share a high level of automaticity. In the popular sense of the terms they are instincts, nothing else. The first, partial conclusion that I draw from a distinction between language and communication is that the human language faculty (LF) may have just nothing unique. If recursivity

is indeed constitutive of LF, then Descartes & Co. were somewhat misguided. It may be very easy to build an artificial "speaker". A GPS equipped wristwatch may be such a device, while being utterly devoid of anything even vaguely akin to the wonderfully intricate universe encountered in human communication. Note in passing that none of the considerations here adduced bears on any purported mind-body problem. Recursive systems can be characterized in abstract ways but we have no reason to doubt at present that neurons can implement something like one. [2] Nor there is an issue of consciousness. All the work can be done by sub-personal systems that need not come to surface of awareness. Nor there is an issue of "freedom of the will", a theme dear to Cartesians of all stripes. We cannot compose a sentence in a natural language of 3.6 words. In a very real sense we are not free to do it, while we retain absolute creative freedom, up to surrealist automatic poetry to communicate and miscommunicate at will. A 3.6 words sentence fails to be a sentence: being very optimistic it may be built in an artificial setting, pronounced and uttered. All interpretation will crash, borrowing a term from contemporary computerese, quite like visual interpretation crashes if one looks at some of Escher's prints.

A provisional point can be made at this stage that speaks directly to the concerns of integrational linguistics. If I am correct in identifying an essential property of the language faculty as its recursive powers, we can ask meaningful empirical questions about it, abandoning the somewhat sterile diatribe about what is innate and internal. My own view is that we can and do find recursion, more or less along lines that can be modelled by mathematical (and very simple) tools, in all sorts of non-human organisms and in all sorts of very, very sub-personal systems. It is, e.g., an empirical question whether negation can be acquired or comes with the pre-packaged human system. So far as I understand apes' language they neither have nor have acquired a simple recursive rule humans apply all the time, viz. {when, if... λ is a sentence, [not λ] is a sentence}. It would be an extremely interesting discovery, an empirical discovery, to find out that Kanzi or someone else acquired such a rule. If I stress the empirical, it is only because I see no a priori argument of any kind that might settle such a question. It remains a fact, I take it, that humans have/use/are born with (?)/acquire with extreme ease such a rule. None the less, if it were to be found that, say, the great simian brothers of ours, can use "not", we would have a further additional piece of evidence for the presence of recursion in non-human systems, with the bonus of the discovery that it is learnable via explicit training. We would remain with the small mystery of the mechanisms of the triggering in humans, since we do know even now that there is little if any explicit learning of rules like negation. Whether or not the narrowly conceived language faculty is purely a set of recursive rules which interfaces with other systems in the mind is no doubt an empirical question. The issue here is descriptive adequacy: we need to show that the large family of natural languages is describable by the proper set of rules, no doubt interacting with the lexicon. In a nutshell, for those who like technical language, what I suggest is that from

[2] See e.g. Agüera y Arcas et al. (2001).

the standpoint of cognitive science the chief task for language studies is to show that morphology is irrelevant, largely an artefact of the way we describe language, but nothing fundamental at all. For anyone confronted with the daunting appearance of the quasi zero morphology of Mandarin and the luxurious morphology of Latin, I trust it is clear enough that no a priori argument can show any of this. Much of what we take to be morphology is random noise: a watch is a female in French, a male in Italian, neither in English. One hopes that nothing fundamental hangs on these superficial differences, maddening as they are if one is faced with a normative grammarian. What needs to be shown is what lies behind the surface, as quite traditionally in any scientific enquiry. The wonder of comets has to be replaced, *more geometrico*, by celestial mechanics. The shock of languages where word order does not matter and of languages where it is crucial has to be replaced by the setting of an ordering parameter, triggered by development. Cowley (2004) correctly stresses how important can be the difference between [gondada] and [dadagon]. The challenge as I see it is to show that such a feature is superficial in the sense that it is one of the possible ways of implementing a conceptual distinction and the job could be done in a variety of ways.

If the story were to finish here, we would face "only" a plain vanilla scientific problem: how to reduce the visible complexity of some set of phenomena to a simple, preferably small, set of rules, if possible mathematically tractable. Were that the case, we would just have to take on the divine madness of Sir Newton and look at language with the same tools he used for tides and comets.

This is not correct, witness the massive confusion found for the last two dozen decades in language studies. Many, if not most, in the philosophical community take the stance that language is virtually the only subject matter in which we can apply commonsense methods: dogs are dogs, so 'dogs' means dogs, on the basis of the assumption that we know what meanings are: We don't. We have a perfectly fine folk-linguistics that is highly dualistic, full of mysterious entities, plenty of free will, consciousness and related hard and harder problems (Block, 2003). The distinction around which this paper is built, between a narrowly conceived language faculty and a broad notion of language faculty at work in communication is particularly relevant. A general maxim to heed in enquiry is that there is no science of everything, and the study of communication is limning dangerously the study of everything minds do. Even the fabled theory of everything in physics is not a theory of everything in this sense. Where communication is involved we find easily people throwing around words like meaning, comprehension, understanding, rationality, and even knowledge and culture. I am sceptical of such approaches. Not because there is no communication. Nor because the phenomena are not of interest: by and large we spend 90% of our mental efforts in communication of one sort or another. The reason is far simpler and far more selfish in nature. My humble opinion is that we have virtually nothing to gain from it. Science is a harsh master and does not reward the slaves with grand visions. Rather it produces piecemeal understanding of limited scope: pretty as strings and branes are, they tell us nothing of value about, say, symbolic systems. Likewise linguistics narrowly conceived offers a tiny window of opportunity to understand what minds are (can be), virtually nothing worthwhile about

the ways in which the said faculty is put to use. If, for instance, we look to narrow LF for a theory of dialogue with predictive value, the results are slim to none. The best results gotten from narrow LF concern judgments of well-formedness. It is fairly visible, I suggest, that rather different modules are at work in the implementation of language. I present a very simple classroom example. The surface structure and semantics of these two sentences is the same:

(A) Can you swim?
(B) Can you pass the salt?

Yet virtually everyone takes (A) to be a yes/no question and (B) to be a more or less veiled imperative. My question is about minds: how do we know the difference between (A) and (B)? Knowing the distinction appears to be part of linguistic competence over and above any narrow definition. It is indeed one of the ways in which we understand what an utterance means. It is not by any stretch of imagination part and parcel of what I was suggesting can be characterized as our language faculty in narrow terms. So we have to postulate that the narrow language faculty has two properties: first it interfaces with other sectors of the mind, secondly it can be hired for service by almost anything else. One minor terminological point: I just used mind and it is a spelling choice, those who prefer brain can freely replace any occurrence. It is just too bad that our present neurology does not have the resolution to watch, e.g., interfaces. One not so minor other point. I assume a modular conception of mind, in the minimal sense that we can identify and conceptually isolate faculties. Vision does not work like language, olfaction even less. For the imperialist neurophilosophers this need not be a problem: it may very well be that the inquiry will find a single unified neural mechanism that can physically implement all faculties. In which case we'll know that faculties as here conceived are abstractions, very much like the very same cellular mechanisms can produce bones or livers. Back to non-terminological issues. Interfacing is a condition the language faculty has to meet because I take it to be self-evident that we can verbalize thoughts and at least some component of thought is concepts, that are in themselves non-linguistic. By the same token the language faculty has to interface with a host of motion-control units in mouths, lips, fingers and so forth. Fingers are there because of sign languages which display the same features of spoken languages while lacking the phonological aspects. The language faculty can be hired because we have reasons to think that infants are intelligently communicating before the onset of language use. I surmise, as an empirical claim having nothing to do with innatism, that children adopt their language faculty once in place and use it. Despite fascinating attempts to the contrary, I find it pretty unclear to postulate an independent entity language that speaks us, as some fancy philosopher likes to claim. Aside from these considerations, we have none the less to look also at a faculty of language broadly conceived. The problem is daunting exactly because it borders with a science of everything minds do and can do. Consciousness raises its ugly head because we communicate consciously more often than not. Speech acts are certainly intentional, and not in the philosophical sense: they intend to convey specific meanings. "It is hot in here" (can) mean to convey

the imperative to open the window. Two sorts of considerations seem paramount in a naturalistic attempt to understand what the broad language faculty does or is. The first is to try to reduce its supposed human uniqueness. The second is to understand clearly how much of it can be reduced to mechanisms that require no miracles. Indeed if there is a clear sense to naturalism in language studies it is to take it as a maxim aiming at avoiding miracles.

As for the first concern, I take it to be given that non-human animals and artefacts communicate. For non-human animals I think there is no doubt that we find ever more sophisticated forms of communication among them, from signs of hostility expressed by grinding teeth to the apes' calls that are getting closer and closer to what we would recognize as linguistic behaviour. The extreme view, taken by some, that Kanzi communicates with a language would terminally seal the debate. I do not agree, since, I am told, to this day Kanzi has never mastered negation, something the recursive nature of the human language faculty does at ease. I emphasize again that this is an empirical issue. Nothing at all tells us a priori that, maybe with lots of training, an animal may develop something like LF. It just seems to me that animals do not, on the available evidence. For artefacts the question is even more intricate. On the one side we have a conceptual issue. Persons communicate, not their language faculties broad or narrow. Communication is in principle accessible to consciousness and it is debatable whether any computer or the thing on which I type is conscious in any sense. On the other there is a question of derived properties. Artefacts such as paintings or inscriptions do communicate but it remains controversial whether the property is not wholly derived from their creators. I would suggest that the only reasonable conclusion is that we know not enough about communication to attribute it to artificial machines without further ado; though nothing in principle precludes the production of independent communicating machines. Animals are machines of a very particular type, products of evolution and not of human design, so I see no a priori argument to rule out that such design could achieve what nature achieved blindly.

As for the second concern, only an approach aimed at minimizing miracles can be suggested. If it is correct that the language faculty can interact with a conceptual/intentional system and with a motor control, we have no principled reason not to think that it can interface as well with a host of other systems that are not themselves linguistic. In spite of recent triumphalism over the issue, I surmise that we are very far from a general topography of a mind, let alone a general theory. That said, something can be said.

Consider again the pragmatic examples above. To give but one example, relevance theory (Sperber and Wilson, 1995) subsumes with elegance, as well as with some difficulties, the interpretation of utterances under a general minimax principle which is a form of optimizing behaviour. We communicate hiring our economic faculty and a theory of other minds faculty. In short we take on board certain assumptions about others being like us in trying to obtain maximal or optimal result from least efforts. We try ourselves in communication to maximize results by lean and mean methods. An excellent example of this is sarcasm, which aims precisely at shocking an audience and force it to reconsider a literal interpretation of what one says. To produce one more example, take the well attested fact of metaphor.

We assume–*we* assume, language does nothing at all here other than providing lexicon and syntax—that an audience's interpretation modules take truth to be the default condition. If I say that snow is white, the default assumption is that I want to say that snow is white. When I say that Katerina empress of all Russias was a pig, I want my audience to balk at the notion that I am ignorant enough to think of a porky descendant of the Czars. And I want them to go back along mental garden paths to see that I want them to reject a literal interpretation and go around for some way of linking what the concept of pig can tell them about my political opinions of the autocrat. Interestingly enough similar mechanisms are at work when one uses obviously true sentences. "No man is an island" is very true and yet the poet was forcing the audience to use an economic principle. It would not be worthwhile to spend effort in communicating an obvious truth to people assumed to already know it. The presumption at work (part of a theory of mind?) is that Donne would go to such length to say something worthwhile. Intricate networks of this kind of mechanics are at work in communication. All of them are interactions of different modules of the mind. Interestingly mechanisms such as these are often below a conscious threshold. We can surmise they are relatively independent. Proofs in this area are scant, but all dissociation pathologies at least suggest a relative degree of independence. We have independent evidence, from developmental psychology, of the existence of a mental system that attributes mental states to others very selectively. The existence in normal minds of such a sub-personal mental faculty is attested by the sad phenomenon of autistic people, who, at a minimum, have great difficulty in making the right kind of distinction between their parents and their shoes. It seems reasonable to postulate a relatively independent faculty that takes others of the right species to be or have minds. Likewise much of what has been learned about normal development shows that small children initially fail crucial tasks of attribution of mental states to others, and develop it without any teaching at a threshold. I am here referring to the 'false belief' experiments, widely replicated. In the same vein I cannot help but think, against many of my colleagues, that our beloved faculty of being rational can be implemented by a mechanism of optimization in which the only inputs can be preferences and output choices and behaviour. Strategies as basic as foraging in animals may display such form of rationality with no need whatsoever to impute obscure animistic properties to them. If some theorists are correct (see, e.g., the contribution by Ross (2004)) such rationality can even be artificially implemented in computers simulating games. Rationality thus conceived is not exhaustive of the folk notion of intelligent behaviour, it is however part of it. This does not exclude the existence of areas of intelligent, purposive behaviour that are not rational in the sense of being suboptimal. Neither it does exclude the very possibility that capturing theoretically minds, that is intelligent behaviour, may entail non-eliminable normative elements. It goes though some way towards an integrated naturalistic understanding of mind. It is also evident to me that concepts, whatever they ultimately are, are not linguistic in nature. Consider the simple fact that we have more colour concepts than colour words. The level of discrimination of our perceptual system is not matched by our lexicon. If in doubt, try to name shades of particular wavelengths—and there are natural languages with fewer colour words than English.

The language faculty with its lexical powers is used by the conceptual system because of its expressive powers. [3] Likewise anything we can achieve by communication whether rationally or not, is greatly facilitated by the use of language. Consider the extreme difficulty involved in communicating what we get done with a relative clause by means of gestures. The language faculty indeed provides even dummy "concepts" like indexical terms to name on the fly, as it were, anything we care to call attention to. [4] It is indeed useful to have the wherewithal to express thoughts, with all their creative and surprising aspects. The machinery though may have nothing supernatural to it. It looks more like the usual array of gadgets that get a function once nature finds a way along physical and morphological constraints. A small gadget like a recursive mechanism gets used in an amazing way. It may be that in humans it is used for language, in insects for navigation and who knows where else. The conceptual and intentional system gets to use it when and how it finds it. In objects and organisms devoid of it, the system communicates, perhaps more primitively without it. The pressure may be the same (conquest, flight, survival, better feeding strategies or what have you) the surface effects very different. No species so far as it is known developed a symbol making and using capacity akin to the human one. Addressing however our main focus is still needed. It is apparent that I took an I-view of the language faculty. Narrow LF can be described and studied in isolation, much as we can study gastrulation or bone formation. Language as communication is however a social phenomenon. I am not sure whether it ought to be under the philosophical rubric of externalism. Communication is, I suggest, better seen as relational in the direct sense that more than one agent is involved. The remarks above though sketchy indicates a way to destroy the supposed uniqueness and loneliness in nature of human communication. Communication depends upon mechanisms that are shared by other species and narrow LF is based on properties shared by systems that have nothing to do with communicating anything. The grain of truth of the Cartesians' intuitions that humans are unique lies in the strange, maybe accidental, combination of both faculties in one and the same organism. Narrow LF includes an interpretive system that can take anything as input: "Je connais encore que les rochers & d'autres corps semblables peuvent faire entendre, non-seulement des sons, comme les instruments de Musique, mais des paroles bien

[3] I note in passing that recent views, e.g. by Chomsky, on the perfection of the language faculty in meeting interface conditions are independent from what I say. Conceivably the language faculty, being itself a natural product, may be designed less than optimally. Again all of this is independent on the open issue whether language itself as humans possess it is an evolutionary effect of adaptation, or a spandrel, or a side effect of constraints that have nothing to do with any of the above. Any option is wholly compatible with a naturalistic understanding since even if language is not the result of Darwinian adaptation, it is an accidental output derived from physical properties of the system.

[4] This is developed in tedious technical detail in Palma (2004). Technicalities therein are of interest solely to people with an interest in binding and anaphora, and/or to those who care about indexicality.

articulées." [5] It is the job of other modules to take parsed, segmented, interpreted noise as a piece of language and together with yet other systems as communication. The process is not always smooth. What interests me here is that we ought to see the language faculty in general as doubly relational. The interface properties of narrow LF are relational because by itself it does literally nothing, much like numbers by themselves do not count or perform multiplications. The relational properties of the broad language faculty of communication are even more evident. Nothing could be done in communication, much less successful transfers of information achieved, if the faculty itself were not able to interact with all sorts of other mental modules, e.g. rationality, preference ordering, perception, theory of mind, etc. Note that while it is speculative at this stage to say anything definite on the subject, it may very well be that communication is relational also in the sense of requiring conceptually more than one agent even to get off first base. This seems to me not evident since a mind as popularly conceived may be far more distributed than we usually assume. We have no reason, argues e.g. A. Clark, to take skin boundaries as the last frontiers. Memories can be jotted down and people use cell phones as memory storage all the time. In the philosophical literature we encounter the famous, or infamous, argument concerning the impossibility of a private language, [6] which while very intricate seems to me to be precisely what we ought not to follow up in naturalistic enquiries, since it mixes liberally normative and descriptive notions. Closer to my concerns are the considerations from developmental psychology suggesting at least that infants severely deprived of parents, family, community or what have you, appear to have missed the triggering at the right time that sets the thing in motion. Cowley (2004) argues, if I understand him correctly, that broad LF depends even genetically from another mental module that is mimetic in essence. So it may very well be that broad LF needs a social setting to develop, though once again nobody teaches anybody to be an optimizer in the balance between efforts and desired results or to be relevant and to expect others to be relevance maximizers.

Narrow LF does not make mistakes: it crashes when it meets hurdles impossible to overcome. The broad LF does not make mistakes: it may achieve very nasty results, when it takes bad inputs, badly chosen preference orderings, ignores the utility built in being polite, or to conform to one's peer group signalling strategies. We make mistakes since what we take to be persons are just intricate networks of different modules each one of them is, hopefully, describable in purely descriptive terms. The sum total of it all (a fabled theory of how the mind works) may be so far beyond our present capabilities that we are bound to construct philosophical theories about it even to be able to ask the right questions.

[5] "And yet I know that rocks and similar bodies can make us hear not only sounds, like musical instruments, but also well articulated words" (Cordemoy de, 1968). Immediately after the passage translated here, Cordemoy goes on immediately to point out that he knows that rocks do not speak, because they lack minds. His theory of mind module takes over immediately to discern the truth of the matter, while his interpretation module—his narrow LF—takes any noise as language.

[6] Whether by Wittgenstein, Kripke, or by the semi-fictional Kripkenstein who claims that it is not only impossible to have any language in isolation, but also to follow any rule at all privately.

The perspective here taken is unabashedly naturalistic in that it tries to reduce minds to mechanisms. It barely needs reminding that such perspective is limited in scope and narrow in its results. The price to pay is high. If I am right we have to abandon much of the proud arrogant uniqueness and or superiority of humans. Our wonderful languages are at bottom not much more intelligent than adding machines. Our much prized ability to communicate may be not much smarter than computer programs that fix the selling prices of derivatives in the stock market.

What may be unique is the combination of a narrow language faculty and of a broad communication faculty in one single system. Our modest contributions can only be at this stage to push mechanical comprehension as far as it can go. Limits are likely to exist. Colin McGinn is fond of reminding everyone that there is no reason to think that everything with regards to the mental is open to understanding. The job at hand is to see where the limits actually are. My only conclusion is extremely simple. We have no reason, when studying the mind, to get entangled in general theories about intentionality, reference, or worse, culture and the like. Progress can be made along purely empirical lines.

How far naturalistic enquiry will go, time will tell.

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