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Did Alex Have Language?

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Abstract
This paper argues that the utterances made by the renowned talking parrot, Alex, were not only meaningful and sincere, they counted as a language. Three arguments are considered in favor of this claim: 1) Alex demonstrated the capacity for recursion, 2) Alex satisfied the Davidsonian requirements for a talking entity to have language, and 3) Alex satisfied the Searlean requirements for making speech acts. The paper concludes that the pieces of human language that Alex most readily acquired and those pieces that he lacked might point out a kind of evolutionary path by which our ancestors acquired the language that we now speak.

1. *Introduction*

On September 7, 2007, I picked up the New York Times to read "Brainy Parrot Dies, Emotive to the End." Underneath this caption was a picture of Alex. I found myself catching my breath, fighting on tears. I grieved all day as though I had lost an old friend. I still keep his obituary and his picture on my desk prominently displayed next to photos of other friends and family members. I had never met Alex.

It turns out that I was not the only person who had become attached to Alex. The world's newspapers and televisions ran obituaries of Alex. Why was a parrot so fascinating to all of us humans? Why did we love Alex? After all, it was not as though we had never seen a talking parrot before nor other kinds of animals displaying intelligent behavior. We have watched Koko, the gorilla, sign for years. Why did Alex capture the world's imagination, if not its hearts?

The difference between Alex and the rest of the linguistically enculturated animals including dolphins, gorillas and chimps, is that Alex could actually speak. And when he spoke, he did not seem to be merely "parroting" human linguistic noises. Alex seemed to be using language to communicate in the way that we use language — as a tool to communicate with others. Alex expressed himself well and to all appearances he was performing speech acts. Of all animals, Alex was the the most outstanding exemplar of a talking animal. Because of this, he intrigued the world at large, and particularly piqued the interest of academics because of the possibilities that Alex's abilities raised.

Among these is the possibility that animals might not be all that di□erent from us. Those pets of ours, not to mention those animals out in the fields,

jungles and zoos, just might have emotions such as likes and dislikes, fear and joy. But most of all they might even have thoughts about their world and even about us. Of course, the only way we could ever establish such a thing is if we could talk with them. This is where Alex came in. For thirty one years, Alex told us not only about his likes and dislikes (which he certainly did), but he also showed us something more astounding: Alex could think abstractly. Alex could pass the psychologist's gold standard tests of grasping the notion of "same as" and "different from," that is he could categorize, but it also appears that he could pass tests for understanding the notion of types, that is he could conceptualize. Furthermore, Alex could do simple logic problems and even understand the notion of sets. When tested against the abilities of three and four year olds in basic reasoning, Alex tested at the level of about a three and a half year old human child. This is a stunning discovery for a nonhuman with a bird brain.

Although it is not disputed that Alex could perform intelligently by means of language, it is not generally assumed that Alex had language in the same way that humans have language. A closer examination of Alex's linguistic capacities is required in order to establish such a fact.

If we are to examine Alex's communicative abilities in any depth, several questions need to be answered. The most obvious question comes from a behaviorist analysis: Was Alex was using vocal sounds as a matter of differential behavior without content? Had he learned to mimic human sounds and then use the sounds appropriately because he learned some rules to the effect of, "if X then Y?" Had he also learned the effect produced by these sounds, namely that he achieved predictable results? If this is the case, Alex did not understand the meaning of the words he was using. To borrow a famous philosophical example, we could say that Alex was merely a parrot in the Chinese room.[1]

I think most sceptics either are or could be convinced that Alex's behavior was not merely differential behavior. Excluding behaviorism, the next question is more intriguing: If Alex did understand the content of his utterances, did he have a language? The problem with answering this question is that there is no general theory of the necessary and suffcient conditions for what counts as having language. Indeed, there are no necessary and sufficient

[1] The Chinese Room is John Searle's well-known example of a human in a locked room who has been given a set of Chinese symbols and a rule book. By means of the rule book, he can respond to questions written in Chinese that are passed through a window into the room. The human gets very good at passing out the correct string of symbols merely by following paradigms of if X then Y that are given in the rule book. But with no exposure to the referents of the symbols, the human does not understand the semantics of the strings of symbols he can produce. c.f. Searle, J.R. [1980].

conditions for what counts as language itself. But there are some minimal constraints for what counts as having linguistic ability. These constraints can be divided into three categories: syntactical, semantic and pragmatic.

2. *Alex and Syntax*

In a recent article, Chomsky, Hauser and Fitch[2] proposed that human language is different from animal communication because of one crucial feature: Humans have an innate grammar. To put it simply, humans have an innate capacity to generate an infinite amount of well-formed syntactical strings because there is something in their brains that acts like a set of rules (early Chomsky) or paradigms (later Chomsky). These rule or paradigms for an innate grammar are part of the neurological birthright of the human species. This innate grammar allows humans to communicate by means of syntactical strings and not merely by isolated signs. Chomsky, Hauser and Tecumseh named this particular communicative ability, Faculty of Language Narrow (FLN). On their account, only humans have FLN.[3]

On the other hand, they claim animals have communication, even symbolic communication as might be the case with vervet monkeys, for example. On this account, animal communication is a kind of language but it is not the structured, syntactical activity that humans produce. The capacity for semantic language that lacks syntax is called "Faculty of Language Broad," (FLB).

It is important to keep in mind that the crucial distinction between these two forms of communication (or languages) is whether one is generated by means of a small set of rules, i.e., recursively. A fuzzy area for theory arises at this point when we examine the capacity for recursion. Is it sufficient for having language that knowledge of recursion be conscious? Or, must recursive knowledge be solely at the unconscious level? Chomsky insists that this knowledge must be unconscious. This insistence on the unconscious knowledge of grammar is a strength of Chomsky's theory because it can explain why children spontaneously learn language under degenerate circumstances.

But the unconscious innateness of grammar is not scientific in that there is no way to test it. Data show that children learn grammatical paradigms at a predictable rate in a predicable fashion, namely, they practice when no one is watching. This verbal practice might be the mechanism that strengthens initial grammatical input in the form of neural connections. This explanation,

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[2] Hauser, M, Chomsky, N., Fitch, T. [2002].

[3] The formulation of innateness of grammar, the Innateness Hypothesis, is due to Chomsky.

though scientific, is not the Chomsky criterion for his hypothesis of innate grammar (innateness hypothesis). Chomsky's hypothesis allows children to spontaneously engage in linguistic communication because they already have the appropriate neural connections. Practice strengthens what is already there. Whichever direction the causal relations between practice and neural strengthening, there is a fact of the matter: Alex also practiced his paradigms when no one was watching. Alex displayed the same behavior as children do. Did he have knowledge of his own language in the way that children do? In both cases, only empirical data can tell us.

There are three levels at which recursion and generativity are applied in linguistic analysis. These are at the level of phonemes, morphemes and sentences. At any of these levels, language has particular rules of combinations. For example, as English speakers we know that the phonemes [c] and [p] are not combinable. But we do know that both of these same phonemes can be combined with the phonemes [t] (section; deception). Similarly, at the level of word building, we know that the words "section" and "deception" are constructed by two morphemes, and share one morpheme, [-ion]. At the level of syntax, we know, for example, that if you transpose the two nouns in "The cat bit the dog" as "The dog bit the cat," the sentences have different meanings. This is the sort of knowledge that we have of our own language.

At all three levels, Alex appeared to understand recursion. It is not an overstatement to say that his understanding of phonemic construction was even more sophisticated than that of a three year old. As an illustration of Alex's recursive capacity at the phonemic level, the following example is worth repeating in its entirety. In this example, Irene Pepperberg was training Alex to comprehend the notion of phoneme by first understanding that sounds themselves could be separate functional units. She began by assigning sounds to familiar stimuli, e.g., colors. She assigned a sound to each color. For example, blue was the sound, s. Examples of colors that represented sounds were in forms of plastic refrigerator letters and numbers.

On one day, a camera crew arrived to film Alex. It was a day that Alex was particularly recalcitrant, having his own ideas about what he wanted to do. In his recalcitrance, he more than demonstrated that he mastered phonemes, but he showed that it was all too easy for him, and perhaps just a bit boring:[4]

I: Alex, what sound blue?

A: [S]

I: Good birdie.

A: I want a nut

I: (pressed for time, did not reward Alex but continued with the test):

[4] Pepperberg, I. [2008], pp.178-9.

Alex, what sound green?

A: [Sssh]

I: Good parrot.

A: Want a nut.

I: (again ignoring his request): Alex, what is OR?

A: Orange.

I: Good bird!

At this point, it was apparent that Alex was becoming frustrated. He narrowed his eyes, stared at Irene Pepperberg (he apparently had di□erent expressions), and slowly said the following to her:

A: Want...a....nut...*Nnnnnn...Uuuuuh...Tuuuuh.*

At face value, this story is very funny. Alex was fed up, and he made a sophisticated joke at two levels: 1) he second guessed the point of Irene Pepperberg's test and used it to his own advantage by making a request. 2) He reversed role playing by acting as the teacher and treating Irene Pepperberg as the student. A very good bird indeed.

But the academic point for our purposes is one that is more startling: Alex's decomposition of the word, *nut*, into its constituent sounds was new and spontaneous. Alex had not yet been taught to spell. Alex was just in the beginning stages of learning sounds. This episode shows that Alex not only had knowledge of phonemes, but that he understood how they were combined. He gave us a top-down analysis of the word, "nut," something that human children learn to do in school in the first grade. The question of whether his knowledge of phonemic recursion in English was unconscious or conscious seems unimportant here. Alex spontaneously grasped a rule of English recursion and could apply it to a new circumstance, just as a human speaker could do.

Alex also created his own words for objects. He worked on different combinations all the time. Often the words he created seemed more appropriate to him than the words he was given. The words he created were often generated by putting two familiar words together to form one word or one expression. Examples of this are, *corknut* for an almond, *yummy bread* for cake, *banacker* for a banana cracker.[5]

Sometimes, though, his words were a matter of creating a single word from two other morphemes. This is the case of *banerry*. *Banerry* was a word that Alex created for the object, apple. Before attempting to teach Alex the word for apple, he had only been given cherries, bananas and grapes to eat. During repeated attempts to teach Alex the word for an apple, Alex, for whatever reason, appeared not to be able to learn the term. And interestingly, he also refused to eat apples. This project was abandoned for several months but was

[5] c.f. Pepperberg, I. [2002] pp.238-241.

taken up again. In the meantime, Alex had begun to eat apples. During one training session, he looked intently at the apple and called it *banerry*. He was corrected repeatedly with the term, "apple" with prosodic emphasis on the syllabic construction as [ap-pul]. Alex stubbornly responded with his own word, "banerry" imitating the prosodic syllabic construction [ban-er-ry], as his trainers did with "apple." He never called apples by any term other than banerry from this point on.[6]

In this case, Alex demonstrated generative ability at the morphemic level. But he demonstrated something else which is that he had created his own concept of apple. His concept of apple lay somewhere in his gustatory and visual experience between a banana and a cherry, but notably not a grape. Alex created a category for a new kind or set of object in virtue of features it shared with other objects in his experience. This is a highly abstract capacity in any case but in this case, it took a lot of thought: The new concept, "banerry," appears to be created by analyzing the fruit in two ways, 1) both by its exterior and its interior appearance, and 2) by extracting matching appearances from the fruits already experienced. The exterior of the apple best matches the exterior of the cherry in that it is round and red. The interior of the apple best matches the interior of the banana in that is it an off-white. This logical processing shows us that Alex not only had representational capacities but a kind of imagery capacity which we call imagination. Alex gave us the first evidence that animals can imagine.

There is a lot of data to support the claim that Alex understood recursion at the phonemic and morphemic levels. But the real test is whether he could generate new syntactical strings. Could Alex potentially form an infinite amount of well-formed strings from the set of words that he knew?

In order to form a well-formed syntactical string in a language, there must be a verbal expression. Studies on children's language development track the time at which children acquire verbal paradigms. Children begin to follow verbal commands at about the age of 12 months. Between 12-18 months, children's vocabulary grows about the rate of 2 to 3 words a week, and between 18 months and 24 months, they begin to acquire words very rapidly at the rate of 3 to 4 a day.[7] At about the age of 22 months children begin to acquire verb island constructions. These are a set of paradigms which outline the possible permutations for a given verb (e.g., imperative, transitive, intransitive, etc.). An example of these verb islands can be given for the verb, "to grow":

I grow turnips. (transitive-active voice)

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[6] op. cit. [2008], pp.404-5.

[7] Dr. Kyle Steinman, January 27, 2009, UCSF Memory and Aging Seminar.

Turnips grow in my garden (intransitive)
Grow your turnips in a sunny spot. (imperative)
Turnips are grown by me in my garden (passive voice)

Children learn these verb permutations and practice them. In theory, they then generalize these paradigms for all verbs. This serves as an explanation for why children make grammatical errors in verbal inflections that mark these verbal constructions, but do not make mistakes in the syntactical constructions themselves. Thus, you might find a child say something like "Turnips growed" in which the past participleed is transposed from other verbal paradigms to the verb, "grow" whose past tense is "grew." But you do not find English speaking children making mistakes of word order or voice such as "turnips grow I," which might be an acceptable string in another language. That children do not make syntactical errors in their native languages is yet another argument for Chomsky's innateness of grammar hypothesis.

Alex could generate strings of well-formed English sentences based on the few paradigms that he knew. He was taught the verbal paradigm *X want Y*, which he used a lot. The extent of his usage was limited to *I want Y*, or merely *want Y*. He learned by context the intransitive verb, *go away*. When his trainers would explain to him why they were leaving using the expression, "I am going away to eat lunch/dinner now." Alex grasped the expression without explicit training and used it as *I'm going away*, *I'm gonna go away*, when he wanted to stop training sessions subsequently trying to leave. In addition, he also began to use the verb in the imperative to try to make the trainers leave: *Go away!*[8]

He had a handful of other verbal expressions such as "tickle" (as "you tickle (me)!(imp)"), "pick up," (you pick up Y!), "come" as in "(you) come here!, " "go" as in "(I) go chair," "Calm Down" as in "(you) calm down!," the " is" of predication and the "is" of identity: X is blue, and X (This) is a key chain)".

From the limited amount of verbal expressions, critics of Alex's language capacities feel they have the strongest argument that Alex did not have language, but was merely engaging in some sort of Faculty of Language Broad.[9] Human children learn more and more words at an exponential rate and they can use them in growing numbers of constructions. But Alex's verbal

[8] op.cit. [2002], p. 241.

[9] Even his beloved trainer and lifelong companion, Irene Pepperberg, told me that she did not really
think Alex had language. He could not engage in a regular conversation (personal correspondence).

constructions were limited. The argument then goes that if Alex really did have the Faculty of Language Narrow, his linguistic repertoire would not be limited. He would have begun to acquire other verbal expressions from contexts without explicit training. If Alex really had language, he would be like a child acquiring verbal expression from merely hearing the speakers around him. For example, in theory he should have been able to pick up the usual banter such as the following:

Where did you get that coat, Sally? Oh, I got it at Filene' Basement and it was only 25.00 what a steal!

A human child might begin imitating what he or she had just heard, perhaps initially with no pragmatic accuracy (which often makes children's speech funny), but later on, being able to use it in imaginary exchanges with friends: What a steal! I got it for 25.00! etc. Although Alex did pick up banter (as any parrot owner will tell you, talking birds do), and he did use expressions meaningfully as when he told Irene Pepperberg to calm down when she came into the lab one day upset, he did not do this at the rate children do. Thus, the argument goes, Alex did not speak a language in the way human children speak it. Rather, he was learning contextually appropriate utterances, but he was not generating new strings by recursive rules.

This argument is invalid for many reason, but one in particular: Language is a function of one's social world. Alex's social world was necessarily shaped by his parrot body, his parrot perceptual capacities, in a word, Alex's world was essentially a parrot world that happened to intersect with humans. Alex's vocabulary was large for a bird (about 150 words), but small in comparison to that of a human child because his world was both species-specific and limited to his parrot concerns. He lived his entire life in a laboratory surrounded by a lot of loving trainers who catered to him all day, training him in activities that, while meaningful to a human, were not essential to Alex, such as being able to identify a key chain. Unlike a human, Alex did not have the opportunity of needing a key chain (for example) or using a key because Alex did not have causal interaction with these social objects in the way we do.

But more important than varied contexts and causal contacts, Alex was a parrot. He learned what he was motivated to know. This is not unlike our life experience. In our daily life, we must interact with conspecifics in a social and institutional manner. We need to know how to do deal with keys because we have to deal with cars, doors and other locked objects. This sort of need motivates our enormous amount of social and linguistic skill. Even if Alex were not constrained to a laboratory, his parrot life would still not include human social skills. Alex would never have the need for knowing how to use money, or how to drive a car anymore than if the situation were reversed, and we joined Alex's parrot world, we would never have the need for knowing the specifics of bird flight. Alex's world would be a parrot world regardless of

context. In light of this fact, it is probably incorrect to look at Alex's vocabulary as limited but rather as sufficient for the social interaction he required in his daily life. In his parrot life, Alex had just the amount of language that he needed.

3. *Alex as a Rational Animal*

Alex had the syntactical mechanisms required for FLN and he communicated by means of these mechanisms effectively. But knowing how to manipulate syntactical strings and how to match them to situations is not really language in our commonsense of view of the term. FLN thus described is just another case of behaviorism, a Chinese Room example of knowing the appropriate syntactical rules and applications but lacking the semantical content that those syntactical strings represent. What over and beyond recursive ability would Alex have required in order to understand his utterances?

There are two philosophical views diametrically opposed which offer a way to answer this question. The first view is that of Donald Davidson. The second is that of John Searle. I will examine Davidson's views first:

Davidson has several conditions that must be met in order for anyone or anything, from Alex to a computer, to have language. Davidson provides a delicate and diffcult argument for his language requirement. For our purposes, we will break Davidson's argument down to four basic conditions that Alex must meet in order to truly grasp the meaning of his utterances. These are:

1) Alex has to have a history of causal contact with objects, events, etc., that correspond to the words and utterances he uses.

2) Alex must have a web of beliefs such that given his commitment to the truth of the statement, "This is a key," he would also be committed to the truth of semantically related statements such as "Keys are not fruit," "Keys are used for doors," "Keys are made of metal and not wool," etc.

3) Alex must physically resemble his interpreters in important ways.[10]

and finally,

4) Alex and his interpreters must share a world such that they have a reliable notion of each other's concept of truth.

What do all of these conditions mean? Let us cash them out one by one. Condition 1 requires that in order for entities to be able to assign truth values to the utterances they utter, they must have a causal relation with the states of affairs those utterances describe. Davidson's own example asks us to imagine an alien visiting from somewhere other than earth. If the alien's own experience of dog-like creatures from his own world were actually robots

[10] Davidson, D. [2004] p.86.

("cogs" though he uses the very same word, "dog"), and he were to encounter an earth dog, his utterance "This is a dog," would be mistaken.[11] He would be mistaken in his reference to an earth dog because he has no history with earth dogs and therefore cannot mean the same thing as earthlings do by the term. This might seem counterintuitive at this point because in fact the utterance "This is a dog," is true on earth. But Davidson's point is that the alien cannot sincerely utter this statement. Grasping the meaning of an utterance derives from grasping the conditions under which a statement is true. In this case, the alien has not had suffcient time to establish the conditions under which "This is a dog," is true on earth because in his life history, its truth conditions are entirely different. For the alien, "This is a dog," is true for his robot dog – the cog — mistaken for earth dogs. In time, the alien will learn the appropriate truth conditions for the earth utterance "This is a dog."

Condition 1 poses no problem for Alex. He not only had a causal history with the words he used, but he actually had learned them through another Davidsonian requirement for language, that of triangulation. Triangulation requires a speaker, an interpreter and a world (i.e., a state of affairs). In triangulating, speakers utter statements about states of affairs to which interpreters assign truth and thereby also establish what the speaker believes. The triangle developed in this interaction is be-tween the speaker, interpreter and the world. In this fashion of triangulation, Irene Pepperberg's method of training Alex was that of demonstrating an object the name[12] of which she wanted Alex to learn, to another trainer in front of Alex. To do this, she would pose a question such as "What is this?" or "What matter?" etc., to another trainer who would in turn say the correct or incorrect answer. To the correct or incorrect answers, Irene Pepperberg gave assent or dissent. And this method was adopted so that Alex could learn language as a function of social interaction rather than a matter of mimicking. True to the Davidsonian spirit of triangulation, Alex watched as two speakers-interpreters established whether utterances were true or false after which he was then given the opportunity of trying his hand at the task of triangulating with one of the trainers. If he responded correctly, he was told he was correct and given the object. If he responded incorrectly, he was corrected. The important point here is that in the Davidsonian tradition, Alex was given the opportunity of first

[11] "He made a mistake in calling a dog, a "dog." Davidson, D. [2004] ibid., p.89.

[12] Irene Pepperberg was careful not to use the word, "name, " but rather "label." In philosophy, the
word "name" does not carry the same problems as it must in psychology. Therefore, I am going to
use the words "term" and "name" interchangeably.

establishing the belief systems of the speaker-interpreter regarding objects in questions because he could see how they both established truth in virtue of what each other believed. Alex passed the test for triangulation.

Condition 2 requires that a language speaker must have beliefs, in fact, a web of interrelated beliefs about the states of affairs his utterances describe. For example, as stated above, if Alex actually believes the statement "This is a key" is true, he would have to have a set of other beliefs consistent with this statement, beliefs such as "Keys are used for doors," or "This key is made of metal and not wool," "Keys are not fruit,"etc. Exactly which beliefs he must have is unimportant. For example, Alex could never have used a key to unlock a door, so it was not necessary that he actually knew the function of a key, but he needed to have some set of beliefs related to keys.

Now, the method by which we would have established that Alex had a set of beliefs was of course by questioning him. But again, Alex could have been a finely tuned robot programmed to give appropriate answers to questions. This method of questioning is ineffective because it is question begging: it uses language to establish beliefs, but in the Davidsonian tradition, must assume he has beliefs in order to use language. It is not helpful because it is circular. What we want to find out is whether there is a test to test for beliefs and not merely for linguistic behavior. Davidson in fact thinks there is one. He suggests that an entity who really does have a set of beliefs is capable of being surprised. The state of surprise is to be distinguished from the state of being startled. The state of being startled is caused by an involuntary body response to external stimulus such as a loud sound. The state of being surprised is an intentional state in which a belief is discovered to be false. Is there a test to determine that sort of state of surprise?

Inadvertently, I think Irene Pepperberg did test Alex for surprise. This was in the form of testing whether Alex had the concept of object permanence. As philosophers know, the concept of object permanence has long been a problem in philosophy, certainly since John Locke wrote about it, if not before. The traditional problem of object permanence is how visual perception allows us to have the idea that objects do not disappear when we do not perceive them. Or to put the problem in the form of a question, How is it the case that we know merely from visual perception which is temporally bound, that objects exist beyond the temporal boundaries of visual perception?

Psychologists since Piaget have developed tests for object permanence, and have stratified the course of the acquisition of object permanence into six stages. (Stage 1) Babies (0-4 months) are not particularly aware of objects and will not not search for an object that they have seen and is then hidden. (Stage 2) Babies during this time period will begin developing the ability to track objects' movement. (Stage 3) Around the age of 4-8 months, babies will begin to look for hidden objectsand at the age of about 8-12 months, they are able to

find a hidden object. (Stage 5) About the age of 12-18 months, babies can do something amazing—they can find an object that has been hidden, found, and rehidden. And finally, at the age of 18+ months, babies understand that objects are hidden in containers (stage 6) This last stage has been elaborated in psychological testing as not only hiding an object in a container, but moving the contained object under another container, or occluding the container in some way. The stage 6 child will when he or she discovers that the container s/he thought the object was in is empty, will be able to infer the object is in another container. This is a kind of shell game and it requires sophisticated reasoning.

Alex was tested along with other kinds of birds. Some of the other birds did well on the tests, but Alex was the star. Alex passed all the tests when he learned the game — and he learned it relatively quickly — thus demonstrating that parrots not only have the concept of object permanence, but can make logical inferences in the occlusion cases. But Alex demonstrated something over and beyond this fact. At stage 6 experimenting, Alex showed the state of surprise. When he first played the shell game at the advanced stage 6 level, he picked up the container under which he expected the object to be under (or as Irene Pepperberg puts it, "where the object logically should have been."),[13] but when he discovered the object was not there, Alex made a clear sound described as "Yip," a sound he made whenever he was startled. But in this case, he was not merely startled. He was surprised. Alex had a clear expectation of where the reward should have been. He was playing the game. He was making inferences, following hidden objects, and he indeed did make the correct inference given the parameters of what he had just seen. But his logical inference turned out to be false, his belief mistaken. Alex had a belief, he discovered his belief was false, and he reacted with the emotion of surprise. If this is not a case of surprise, it is hard to explain it as anything else. But this example does not stop there.

By this stage, Alex was not only playing games of logic, but he began to do something far more sophisticated. He began ordering others to pick up the containers where he thought the reward would be. This required using language to direct others to do work. Furthermore, it required indicating either by means of his body or by means of language which containers he wanted picked up. Pointing and joint attention have been previously ascribed to only human children who develop this skill at about the age of 8 months. In fact, these skills are considered necessary for social linguistic skills to develop (Tomasello).[14] Alex not only had the capacity for joint attention, but he could

[13] Pepperberg, I [2002] op.cit p. 181.

[14] Tomasello, M. [1999] ch 3.

point as a matter of directing another's attention and he could also point as a matter of performing a speech act. There is plenty of evidence in the tests of object permanence alone let alone other data to show that Alex could be surprised.

Conditions 3 and 4 are interrelated. Davidson added these conditions in order to address the possibility of computer thought. Condition 3 requires that in order for an entity to think, it must be capable of being understood by a human interpreter and resemble a person in "important ways."[15] Before we can cash Davidson's conditions out accurately, we need to note that Davidson requires language for thought. Thus a talking computer as well as a talking parrot are sub ject to this condition since the quest is to see if such talking entities can grasp the contents of their utterances.

That a human interpreter must be able to understand Alex is not problematic. But what does it mean that he must resemble the human interpreter in *important ways*? Davidson does not explicitly tell us which of the shared features of resemblance are important, but the implication is clear. Behind this prima facie curious requirement are at least two other philosophical observations of similar import, that of L. Wittgenstein and Thomas Nagel. We all recall that Wittgenstein said that if a lion could speak, we could not understand him.[16] And the underlying idea here is that lions and humans access the world in crucially different ways. What is important to the lion is not conceivable to the human and vice versa. In the same vein, Nagel's famous Bat Story argues that we will never be able to conceive of what it feels like to be bat regardless of how much scientific description we have access to, because simply, the sub ective experience of batness is species-specific. We cannot experience the world by means of sonar, for example because we do not have this cognitive capacity.

Davidson's requirement on human resemblance derives from these examples. The speaking entity under consideration cannot be too structurally different from us for the very reason that in order to play the language game, as Wittgenstein puts it, or establish truth conditions for statements, the entity and the interpreter must have a shared world (condition 4). And in order to have a shared world, both interpreter and speaker must have some cognitive capacities in common. Which shared perceptual capacities they must share,

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[15] It is worth citing the entire quote. "But if I am right, it [a computer] thinks only if its thinking can be understood by a human interpreter and this is possible only if the artefact physically resembles a person in important ways and has an appropriate history." (Davidson, D. [2004] p. 86.

[16] Davidson, D. [2004] p.86; Nagel, T. [1974] 435-450.; Locke, J. [1690] Ch. XXVIII; Wittgenstein,
L. [1953] p.223.

Davidson does not state, but we could guess. At the very minimum, the entities must be able to have physical mobility in order to examine objects and they must share some sort of cognitive capacity that allows them to jointly attend to objects. This is not necessarily visual, by the way. They could share tactile sensory experiences, for example. We cannot understand beings who do not share any of our sensory capacities or motor capacities.

Conditions 3 and 4 rule out the possibility for laptop computers to think. But they do not rule out the possibility that Alex can think. Alex shared at least four important features with his human interpreters : First and foremost, he had vision and could experience objects and particularly shape and color in the way that humans do. Second, he had motor cognition. Alex could not only physically negotiate his environment very well, he also had motor planning: Alex could act on reasons, he could follow orders, he could veto his actions. Third, he had tactition by means of his tongue. Fourth, he had audition. He could hear sounds, particularly linguistic sounds as a human hears them. He could also hear music. Alex satisfies Davidson's requirements for resembling his interpreters in important ways, while remaining a parrot and maintaining parrot capacities, as Nagel and indeed John Locke both noted.

Alex was a parrot, but he was a parrot that resembled humans in the important ways. He met all of Davidson's requirements: he had beliefs, he had rational thought, he shared cognitive capacities with humans. But most importantly Alex resembled humans in the most important way of all: He knew how to use language to be social. It is this social knowledge and this social aspect of his linguistic skill that made Alex resemble us most of all, and perhaps in his eyes, us to him.

4. *Alex as a Social Animal*

Davidson's requirements for having language are epistemic. They are intended to answer the question "How would we know that a talking thing actually was speaking language?" and for the isolated case of Alex, they serve our purpose. But the requirements do not tell us whether other species or even other parrots even have thought, let alone language. In Davidson's theory, only language allows thought and rationality. No language, no thought, no rationality. Alex passed Davidson's criteria and therefore could be considered a rational animal. But without language the rest of his species and even other species too are not rational, thinking entities. This leaves Alex as potentially a freak of nature, the only animal to be able to think.

This "freak-of-nature" charge has been made before about Alex. And while it is true that he was exceptional, it is also the case that for all his intelligence he was a parrot. We have to keep in mind that Alex had a parrot brain. In

light of this, a neuroscientific view of Alex's talents would be that Alex developed innate psitticine cognitive capacities. Complementary to this scientific view is another philosophical view that it was Alex's psitticine cognitive capacities that enabled him to have thought first and then language to express those thoughts. This view is held by John Searle.

Searle's proposed theory is built on his larger program for naturalizing all aspects of biological life including consciousness and intentionality. Language for Searle is "continuous with and an extension of the rest of our specifically human inheritance."[17] As such, Searle's theory is an attempt at naturalizing language. As a naturalist theory would go, Searle builds a logical progression of necessary features for language in the same way that one might build an evolutionary account of the circulatory system. But he claims that this theory is not an empirical evolutionary account. It is rather a logical-ontological account. It is logical-ontological only in the sense that he wants to make a list of logical features for the ontology of language. It should be noted that his use of the term, "logical-ontological term" has another more traditional sense with respect to the two camps of the nature of language., the so-called nativist camp best exemplified by Chomsky and the non-nativist camp exemplified by Searle, et. al., are traditionally referred to as "logical-ontological" and "empirical-anthropological," respectively.[18] Searle's theory of language is ground in one focal cognitive capacity — the capacity for intentionality. Intentionality on this account is any conscious state which has content — i.e. — aboutness. And on this account, the content must be grasped by the possessor of the state as his own. In its most primitive form, intentionality has a causal character: it is the animal's access to the external world. The most basic forms of intentionality are those that any animal can have: sensory experiences of some kind and voluntary movement. In our case, our primary sensory experience with content is that which comes from vision. But vision is not necessary as a primary cognitive access with intentionality. For example, a primary sensory access for another animal could be olfaction. Further, voluntary movement provides the animal with a way to act on the world. For Searle, vision and action are primary and primitive forms of intentionality, but conceptually, it is possible to imagine a creature with only one intentional access to the world, be it sensory or voluntary movement. The point is there must be at least one sensory access with intentionality for higher order thought to begin. To make a long theory brief, thought grows out of this basic capacity for intentionality because thought just is the animal's organization of the world into coherent cognitive structures. To push the picture forward

[17] The quote is not exact. c.f. Searle, J.R [2007].

[18] c.f., Cowley, F. [2001].

rapidly, language then grows out of the animal's capacity to particularize aspects of his intentional contents by means of vocal sounds. Searle's evolutionary-logical story evolves with many details, but the most important aspect of Searle's theory is not in the evolution of vocal sound to express particular mental contents, but rather the impetus behind the expression of mental contents. The impetus is social and social in a particular way: the animal must have the capacity for *deonticity*.

Language for Searle is nothing if it is not the capacity to be committed to the truth of one's utterances and to the promises one makes, in a word, to be responsible to another. This, for Searle, is why language evolved: social structures from the most basic such as the family, to the most elaborate such as the university, require individuals to be able to be reliable, not just momentarily, but throughout long periods of time during which individuals might not even be physically present. Language guarantees this kind of social reliability. Social reliability is guaranteed by deonticity.

What sort of category feature is deonticity then? Is it a constitutive feature of merely speech acts or language in general?[19] For Searle, the answer is clear: deonticity is a constitutive feature of language. Without deonticity, the well-formed syntactical strings produced by the computer are not language because they are not speech acts. Well-formed formulae in English without sincerity commitments are merely strings of syntax.[20]

In Searle's original speech act theory, psychological states are partly constitutive of speech acts. For example, in order for a speaker to sincerely make an assertion, he must present himself as believing the truth of his statement. And for promising, the speaker must present himself as committed to fulfilling the act he has promised, etc. Deonticity is that cognitive capacity that allows the speaker to be able to have sincerity conditions. In this light, sincerity is a social trait.

We are now ready to apply a final test to Alex's linguistic utterances. Did Alex have the cognitive capacity for deonticity? Could he be socially committed? Finally, when Alex spoke, was he sincere?

Alex appeared to be able to perform speech acts with facility. The interesting question at this point is how many types of speech acts could Alex sincerely perform?

Out of the possibility of five categories speech act, Alex could perform four. The only speech act Alex could not perform were declarations. Alex did not have the important variables in place, such as the social contexts for declarations to be performed. Alex did not have social opportunities to

[19]At this point I am allowing the term, "language" to include any possible candidate for language
including syntactical strings for programming.
[20] Searle, J.R [1969].

cooperate in a socially significant way.[21]

It is worth our time to briefly examine the speech acts Alex could perform and how he performed them:

Assertives

Alex performed assertives, mainly in the form of identifications. He was certain of his own knowledge and firmly stuck to what he believed to be the case as in the instance of "banerry." Alex used indexicals, demonstratives and a limited set of pronouns ("I" "you"). He knew personal names but did not use them except in one case of a grad student (male) whom Alex really liked. In his case alone, he would use a truncated form of his name, "Spencer," when he would call him: "Come here, Ser."

In this category, it is worth mentioning that Alex was capable of self-identification. An example of this occurred while Alex was playing one day in front of mirror. At one point, he stopped, studied his image in the mirror and asked, "What's that?" to which his trainer answered, "That's you. You're a parrot." Alex continued to stare at himself in the mirror and then asked, "What color?" to which his trainer answered, "Gray. You're a gray parrot, Alex."[22]

This is a sophisticated interchange and it is not actually transparent what occurred in Alex's mind that day except that Alex did not initially recognize himself. Alex did have other grey parrots as company in the lab, so it probably came of no surprise to him that he was physically like his lab conspecifics and different from his trainers. But at the very minimum, he learned that he was identical with that thing in the mirror, that he was a *parrot* and that he was *grey* (after which he began predicating grey of grey objects). And we are safe in assuming he learned that the image was a matter of identity because he already knew what demonstrative utterances of the form "That is X" meant, and he understood the reference of "you."

One final test of whether Alex could sincerely utter assertives is whether Alex could lie. Lying requires presenting oneself as believing one's assertions as true. Alex could do this and it should be noted immediately, he did this not out of any kind of malice, but out fun and play. An example of this type of behavior was during one of Alex's television sessions in which he was not cooperating. Irene Pepperberg decided to give Alex a "time-out" and took him back to his cage and left the room. As soon as she closed the door to his room, Alex shouted the correct answer: "Two, two, two! I'm sorry! "Two."

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[21] I think it could be argued that Alex could conceivably evolve to learn how to perform declarations.
There is not enough time to argue this in this paper.

[22] Pepperberg, I. [2008] op.cit. p.97.

This is a case in which Alex was being diffcult for reasons of his own, and was *aware that he was not speaking the truth*. His apology and correction are suffcient evidence.

Directives

Alex probably used directives more than any other speech act, much as children do. From the parrot studies, it appears that a function of language is to enable work, particularly work which an individual himself cannot do or want to do. A particularly telling example of this is a test in which Pepperberg's bird were given a chain pulley with a treat attached. In order to get the treat, the birds had to pull on the chain, hold it down with a foot and retrieve the treat. The notable part of this example is that the two best linguistically enculturated birds, Alex and Griffn, were the poorest

at retrieving the treat. But, they directed their trainers to get the treat for them: "Want nut, go pick up nut!"[23]

Expressives

This category is very social in that it is used to express social niceties during social interactions. It is used to express several psychological states such as wishes and desires along with emotional states of love or hate. Alex had learned to say "I love you," and said it to Irene Pepperberg frequently in the evening before she left. Apologies are another example of an expressive. Interestingly, Alex learned the expression "I'm sorry," from context and not from explicit training. He used it appropriately but also when he was scared and wanted attention such as when he was left at the doctor's. At times such as these, his voice became small, and as Irene Pepperberg put it, pathetic.

Commissives

I think this is the biggest test for Alex's larger social sense of deontology: Could he make promises and could he in turn understand promises or commitments made to him?

Alex did not use the declarative "I promise," but he did understand commitment to future actions on his part and others also. For example, when he was uncooperative during filming sessions, Irene Pepperberg would take him aside and explain that if he cooperated, the filming crew would leave soon. Alex would then cooperate. He seemed to understand the social contract that if he cooperated, committed himself to good behavior, others would cooperate with him. Furthermore, he had expectations of other's behavior. Irene

[23] Pepperberg, I. [2004] "Insightful' string pulling in Grey Parrots (psittacus erithicus)is a□ected by
vocal competence." in Animal Cognition 7:263-266, p.264.

Pepperberg would tell him when she left at the end of the day or when she had to travel that she would return. On longer trips the staff would keep a calendar up for him marking off the days before her arrival, the day of which was marked with a happy face for Alex's benefit. When she did not arrive on the expected date, Alex would express his anxiety with feather plucking — something parrots do in distress.

Perhaps the most touching example of verbal commitment between Alex and Irene Pepperberg was the evening that Irene Pepperberg put him in his cage for the last time. The dialogue between the two is remarkably sophisticated not only in its affection, but also because it illustrates Alex's ability to use three different types of speech act, a directive, an expressive and a request for a commissive:

Alex: "You be good. I love you,"
Irene: " I love you, too."
Alex. "You'll be in tomorrow? "
Irene: "Yes, I'll be in tomorrow."
These were Alex's last words. They were uttered perfectly and sincerely.

5. *Conclusion*

There is enough data to convince even the most die-hard sceptic that Alex was doing something intellectually advanced by means of human speech, something he understood he was doing. Alex was neither a robot nor a programmed circus performer. He was speaking albeit with a subset of human linguistic structures, e.g., he lacked passive voice, he had a limited use of pronominal expressions, he could not make relative clauses, etc. So, how should we view Alex's language use?

I think the logical way to view Alex's extraordinary linguistic capacity along with his limitations is as a window on the evolution of language development. There are several points in favor of this consideration:

1) Alex's directive use of language might have been a way of establishing social dominance.[24]

2) The more linguistically enculturated Alex became, the more he began to pass on his linguistic knowledge to his conspecifics. By the time of his death, Alex was correcting the other parrots and even teaching them. In anthropological terms, Alex was instantiating Tomasello's requirement for sociogenesis — using a tool, adapting it to one's own purposes, passing it on to conspecifics. Alex was developing parrot culture.

3) Alex became adept at manipulating his environment with words to

[24] Pepperberg, I. [2004].

create a world as he wished it, so much so that he became less physically adept in some cases (as described above) at manipulating his environment and last but not least 4) Alex understood that expressives strengthened social bonds. Considering these points altogether, it is not unlikely that Alex might have been showing us how and why our ancestors began using vocal sounds for social purposes.

It should also be noted that Alex had not plateaued in his linguistic skills. At the time of his death, he was still continuing to evolve intellectually, much like our ancestors might have. In light of this, his death was a sad event for all of us humans because in Alex we might have been looking into a mirror and seeing our ancestors' reflection. Alex might very well have been our first glimpse into the missing link between prelinguistic and linguistic hominids. Ironically, this glimpse of our past came from a nonhuman species: a bird, a good bird, Alex, a very good bird indeed.

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